The OIL WEEKLY

INTERNATIONAL AUTHORITY FOR THE PRODUCING AND PIPE LINE INDUSTRY

NOV 30 1944

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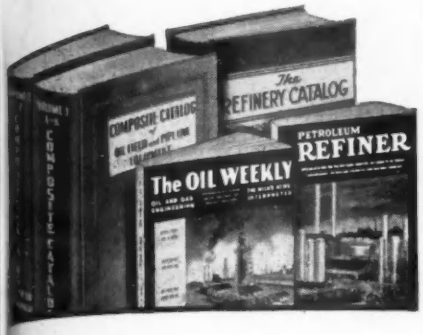

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LOOKING AHEAD
... with the Editor

WITH deeper drilling, mud programs have become more complicated, calling for extremely close attention. A mud engineer finds it no longer possible to separate his duties from drilling operations, and he is forced to be a well-rounded drilling engineer since mud treatment and mud programs have become such an integral part of sound drilling practice.

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All these points are discussed in "Influence of Drilling Practices on Drilling Mud Programs," by E. R. Albert, Jr., division engineer, Baroid Sales Division, National Lead Company, which will appear in an early issue.

THE OIL WEEKLY

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The Changing Panorama

PIWC Action on Oil Pact Most Important

WHAT action will the Petroleum Industry War Council take with respect to the Anglo-American oil agreement? This question promises that the December 6 meeting of PIWC probably will be the most important and lively session in the history of the group, and one of the most important gatherings ever held by oil industry representatives.

Will PIWC act upon the agreement or will it again postpone action? If it acts, will the council merely assert its opposition to any agreement imposing government control? Or, if it acts, will the council temper any condemnation by declaring itself as favoring an agreement which definitely limits the power of any international commission to consultative and advisory recommendations only? Or, if the council acts, will it follow the instructions given it a month ago by Administrator Harold L. Ickes, which were to forward specific recommendations for changes in parts they do not like, rather than just condemn the agreement as now drafted?

The first important move will occur on December 2, when the council's 18-member national oil policy committee convenes in a pre-council session to discuss the matter. At the last meeting of the council, this committee was asked to file a report on the subject at the December 6 meeting. The decision of this committee is highly important, for the nature of its action is likely to determine what the council itself will do.

It is unlikely that the council's committee can fulfill the instructions of Administrator Ickes for specific changes. Since practically every section and even every paragraph of the agreement contains objectionable phrases, it does not lend itself to mere changes. Certainly, it is hardly to be expected that this could be accomplished within a month.

During the past month, some members of the committee have revived the almost secret so-called Pogue-Hudson agreement. Apparently, believing that specific recommendations for changes in the Anglo-American oil agreement were impossible of attainment, it is planned to offer this as a substitute measure. This document was drafted two or three months ago by Dr. Joseph E. Pogue and Judge Manley O. Hudson for the council's policy committee. The provisions of this document have never been made public, for the reason it was so severely criticized in committee sessions it was never presented on the council floor. During the past month, a slightly revised draft of the Pogue-Hudson document is understood to have been circulated to committee members for criticism and suggestions. From a few comments dropped here and there, it would appear that so many objections have been raised against the Pogue-Hudson declaration that it would require an almost entirely new document to eliminate them.

The council's national oil policy committee, therefore, may find that it cannot draft a set of specific changes for the Anglo-American oil agreement, and that it cannot agree on a substitute measure. Will the council act, if these conditions prevail? If so, what will be the nature of its action? It bears repeating that these are highly important questions.

Buy at least an EXTRA $100 War Bond

Self-Sufficiency In Rubber Urged

TWO raw materials which "may be lifted to an utterly new plane of importance in the field because of their availability after the war," said John L. Collyer, president of B. F. Goodrich Company, recently, are the butadiene and styrene, now being produced in enormous quantities for making synthetic rubber. He noted that production of polystyrene has been upped from 4,400,000 pounds in 1940 to around 400,000,000 pounds this year.

Collyer urged continued minimum production of at least 200,000 tons of synthetic rubber annually, after the war, "regardless of the economic factors involved in this coming competition," adding that "no one can say what devilish method might be devised for destroying the rubber trees outside our country, and we cannot be truly strong without self-sufficiency in rubber."

Heavy Postwar Oil Exports Seen Likely

PETROLEUM products and petroleum equipment are included in the list of commodities that most foreign countries expect to buy from the United States as soon as the war is over. Many of the businessmen from 51 foreign countries attending the International Business Conference at Rye, New York, have so indicated.

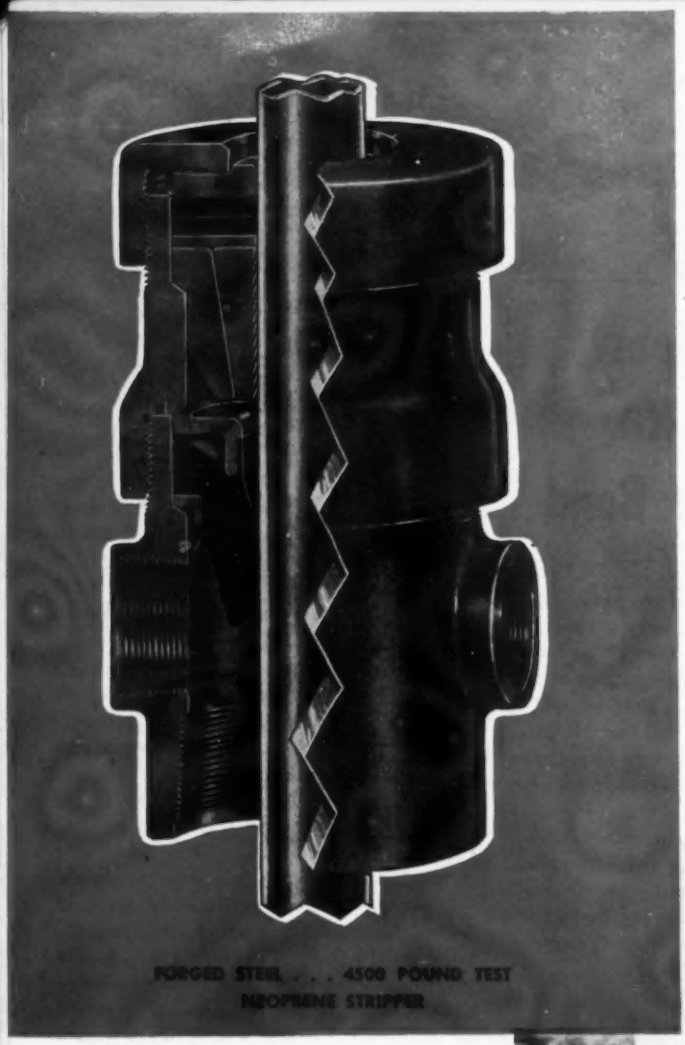
All the countries of Europe, outside of Russia, will want to buy petroleum products with which to conduct rehabilitation work. These nations always imported large amounts, but may import even more than before the war. There will be practically no local production, whereas before the war they produced about 150,000 barrels per day. Rumania will be the largest purchaser of oil field drilling, producing and refining equipment in Europe. Rumania's needs for refining equipment will be especially large. Poland must rehabilitate most of its oil fields. Germany will want refining equipment, and so will other European nations to a lesser degree.

The East Indies fields also have been destroyed. Rehabilitation and normal industrial operations in the Pacific region must depend on other sources for its oil in the immediate postwar era. The need for oil field equipment will be large in the East Indies area.

Other countries want petroleum products to replenish depleted stocks, and others want equipment with which to resume development of their own fields. With the exception of Venezuela and Colombia, all the countries of South America will need petroleum products. So far as oil field equipment is concerned, all South American nations will be in need, especially the more important producing ones.

The countries of Iran, Iraq and Arabia will want equipment, although they will not require products.

The amount of oil needed for rehabilitation work and for replenishing depleted stocks will not be nearly as great as the consumption of petroleum products for military purposes, but these requirements will go a long way toward absorbing the shock of decreased needs created by cessation of war. The United States, the Near East and Venezuela are all producing substantially greater amounts of petroleum than be-



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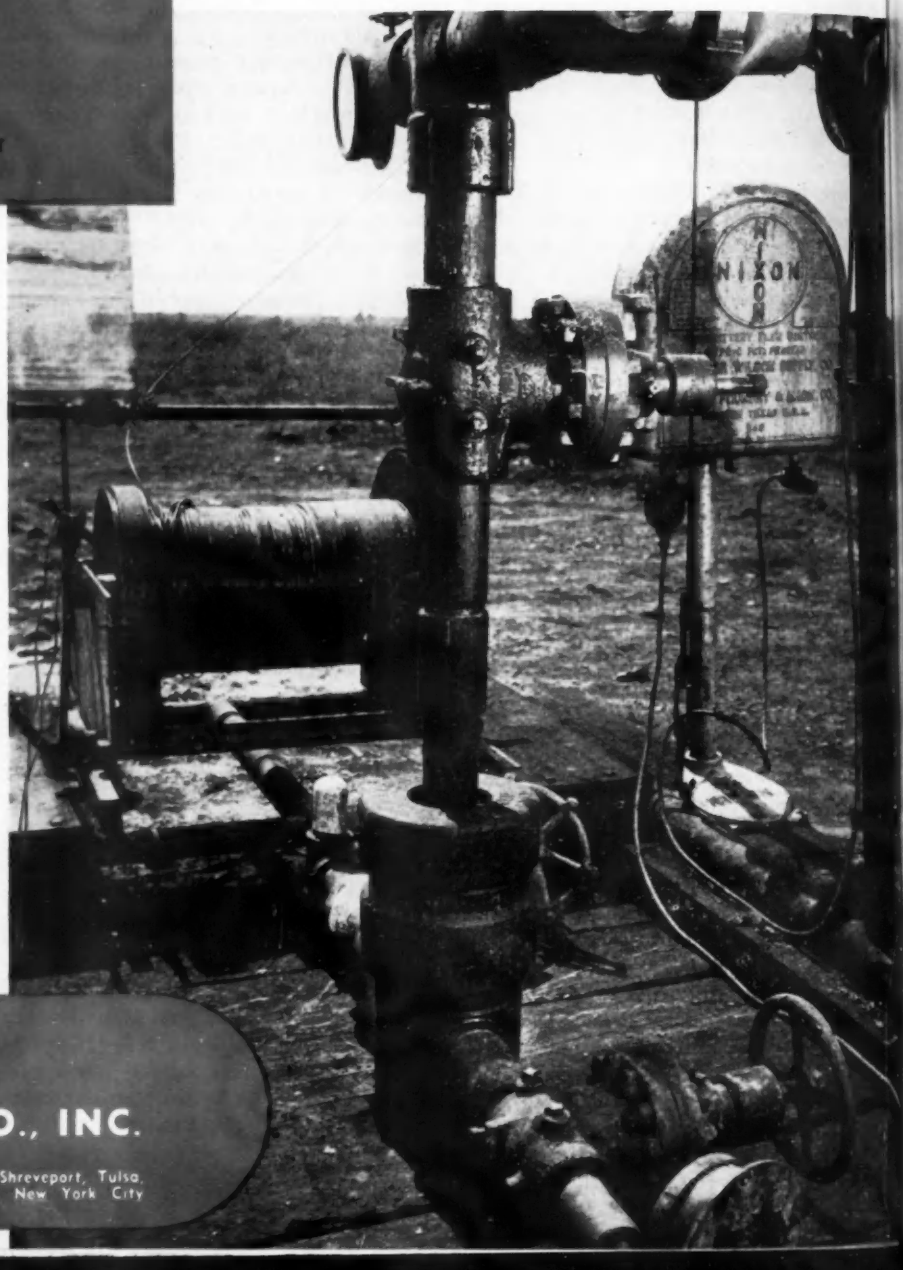

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fore the war, and therefore probably will share in the postwar needs for oil products. But so far as oil field equipment is concerned, the United States is the only source of supply from which quick delivery can be made immediately after the war.

European Drive Calls For Best War Effort

WITH the war perhaps at its cruelest and most desperate stage, General Eisenhower's plea for utmost production of all war supplies and continued cooperation on the home front, should be heeded soberly by every American. The general's advice comes straight from the battlefield and even the dullest imagination should be able to sense its seriousness.

"I wish," he declared, "that you would emphasize over and over again in my name and in the name of the Army that we are at that critical turn of the war which calls for the maximum of effort—more effort than ever before—*from everyone*, without exception. Tell the people at home that the slightest letdown on their part communicates itself at once to men slogging away in the mud, cold and hardship of the front line.

"They are great boys, game beyond belief, and they *must* be made to feel that the people back home are working to the limit of their strength, and even beyond their strength, to the end that not a single life shall be sacrificed and that the war will not last one day longer than is necessary.

"We are on the homestretch and the enemy is using every desperate trick in his bag to slow us up. This year marks the climax. This is the year of maximum effort, calling for everything for the final blow. This is the year of decision and to hasten the end we can't relax for a breath on the front or behind the front."

Future Jeep Jobs

A TEST demonstration of more than a dozen new postwar industrial uses for the "jeep," ranging from operating plant power tools to pulling bulldozers, was recently given at the Willys-Overland Motors plant, at Toledo, Ohio.

Among the most notable accomplishments of the demonstration was the towing of a 14,280-pound trailer unit. This job, which required 63 horsepower, was handled by "jeeps" with the smoothness of a diesel locomotive, it was said.

East Texas Pressure Going Up or Down?

IT BECOMES increasingly important that existing differences of opinion regarding bottom-hole pressures in the East Texas field be settled.

In a recent article, THE OIL WEEKLY (November 6 issue) pointed out that there was a critical need for additional oil to be made available to the Big-Inch pipe line at Longview. It was urged that this situation be met by giving the East Texas field one more producing day a month.

Again, in setting state production schedules for December, the Texas Railroad Commission failed to grant East Texas an additional producing day that would make this oil available. Whether enough oil will now get into the mouth of the Big-Inch pipe line thus is made a most acute problem. The reason for the commission's failure to take such action again is attributed to its report of a continued drop in the field's reservoir pressure. As pointed out in the November 6 article, bottom-hole pressure studies by a group of oil companies, which tests four times as many wells as the commission tests, show a small rise over the same period that the comimssion is showing a sizeable decline. We have no way of determining which of these studies is correct, but feel that with instruments in proper working conditions both studies should reflect a corresponding rise or decline in pressure from month to month. One study should not reflect a rise while the other registers a decline.

Now comes the recent report of the East Texas Salt Water Disposal Company, which makes a very poor showing as to benefits of injecting water back into the field's producing horizon. Using Railroad Commission bottom-hole pressure figures, which are the only ones publicly released, the salt water company report shows a drop of approximately 20 pounds in the field's pressure since its water injection operations started. The company's operations have resulted in boosting injection rates to the point that total fluid withdrawal rates, despite enlarged water production, have been lower appreciably. This was expected to maintain bottom-hole pressures, with the result that gerater quantities of oil would ultimately be recovered from the reservoir.

The decline in pressure shown by commission studies will cause many operators to question benefits of the injection program. It may make it more difficult for the company to obtain additional equipment it now wants for expansion of facilities to handle salt water.

It is highly important that the question of whether East Texas bottom-hole pressures are declining or increasing be settled.

When government is called on to pay what private enterprise cannot pay, private enterprise goes out and government comes in. That, as the examples in Europe have taught us, is a prelude to slavery.

SENATOR STYLES BRIDGES,
of New Hampshire

Election May Affect Oil Pact Deliberation

IT IS conceivable that the attitude of the Senate foreign relations committee toward the Anglo-American oil agreement, and other important policy-making measures, may have undergone considerable change in the recent election. This is an action that could easily influence the future course of the nation.

The complexion of this powerful committee was changed materially when several members were defeated. These included Gerald P. Nye, Republican from North Dakota; Bennett Champ Clark, Democrat from Missouri; Robert R. Reynolds, Democrat from North Carolina; Guy M. Gillette, Democrat of Iowa; and James J. Davis, Republican from Pennsylvania. All these defeated members were expected to fight for definite reservations in any international peace pact, and therefore were more likely to oppose the oil agreement. When Democratic and Republican leaders name successors for the congressional session beginning in January, Senators with commitments or strong leanings toward the administration's foreign policies very probably will be selected for this committee.

Therefore, the foreign relations committee may view the oil agreement in a different light after January 1, when it is now scheduled to be considered. It is important not only for the oil industry but for other business lines to take into consideration the possibilities and ramifications of such changes in the committee and the probable effects upon its subsequent deliberations.

It is my opinion that the United States is at or near the peak of its productive capacity and of its proved reserves. There is much oil yet to be found, but until some new and superior technique of prospecting —a technique which is not yet in sight—is discovered, it does not seem probable that we can continue to find new oil fields fast enough to support our present rate of production.

—E. DEGOLYER,
"Oil for Peace or War,"

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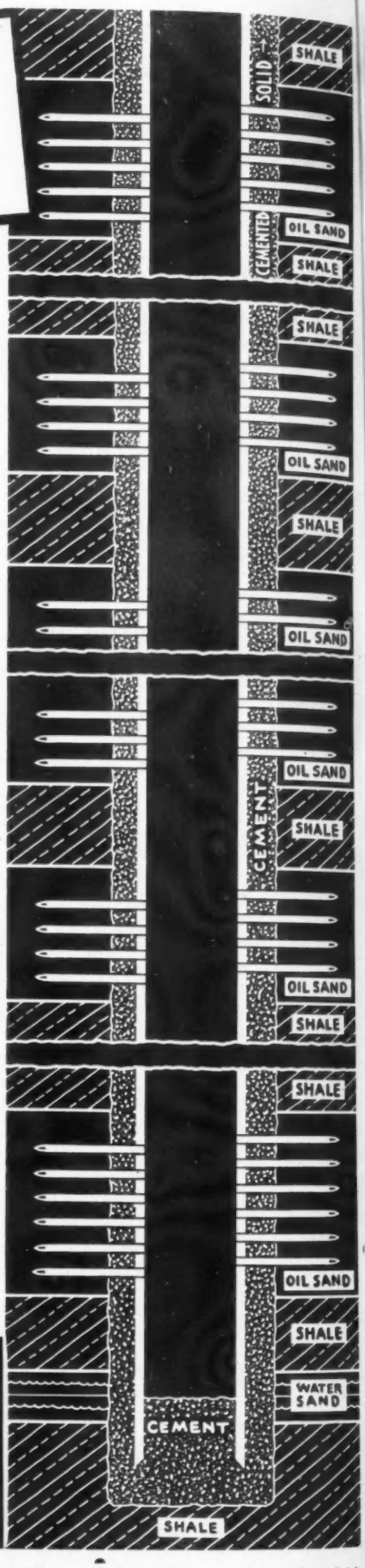

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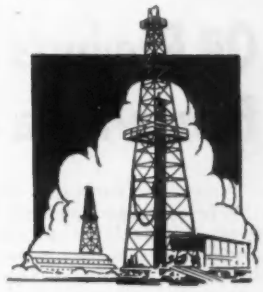

By BERTRAM F. LINZ, Washington Correspondent

THANKSGIVING week—the "national" one—saw oil matters in Washington practically at a standstill, with little indication that the situation would improve before the turn of the year.

Congress Avoids Controversies—Aside from passing legislation of the "must" variety, to continue activities which otherwise would lapse, Congress is disinclined to any action before it quits for the year-end holidays and makes room for the new body which comes into office January 3, and particularly is allergic to suggestions of action on anything of a controversial nature.

East Coast-West Coast Shift—PAW officials admit that they now are "coasting along," with everything running smoothly but on the alert for the unexpected, the next big job foreseen being the shifting of oil movement from the East Coast to the West when the emphasis of war shifts definitely to the Pacific.

Pact Not Abandoned—In Washington discussions there was some talk—but it was only talk—of the Anglo-American oil agreement, prompted by an Associated Press story predicting that it would die of inanition which brought from interested officials informal denials that the pact had been abandoned.

Oil Pact Hearings Delayed But Administration Would Push Through

The Anglo-American oil agreement was seen in some quarters in Washington last week as headed toward a slow death in the files of the Senate Foreign Relations Committee, but in informed circles it was insisted that the pact will be pressed by the administration early next year.

However, it was admitted, industry opposition to the treaty has created a rather critical situation.

Were oil the only factor involved, it is possible that the administration might be inclined to put the agreement to a test without delay, but in view of the fact that it is generally regarded as the pattern for international arrangements which are to be entered into on tin, rubber and other important raw materials, State Department officials are seen as reluctant to take any precipitate action which might arouse opposition in industry generally—which quickly would be reflected in Congress—and imperil the whole economic program of the peace planners.

"No Need for Haste"

Signed by representatives of the Washington and London governments last August 8, the agreement has been gathering dust in the Senate foreign relations committee for the past three months, the only indication of future action being a statement by Chairman Tom Connally of Texas that it would be brought up for consideration sometime early next session.

Officials concerned with the matter explained the delay as due to their promise that the industry would be given ample opportunity to consider the agreement and formulate its views. They point out that there is no necessity for haste since it is an arrangement for the postwar era, which still may be some time in the future.

Both Administrator Ickes and Deputy Administrator Davies have indicated their determination to push the agreement through, the latter stating definitely only a few weeks ago that the administration would press it.

In other quarters, it was pointed out that the administration must put the agreement through if it is to negotiate similar treaties on other commodities, since defeat of the oil pact would bring from other governments pointed reminders that negotiations were useless if the treaties which resulted were not accepted by the Senate.

On the other hand, the administration might arouse determined opposition to international pacts if it forced the oil agreement through as it stands, in the face of industry objections.

Reopen Negotiations?

The best estimate of the situation, in view of these facts, is that sometime after the turn of the year negotiations between English and American representatives may be reopened with a view to clarifying the present agreement. Interested officials have taken the position that the agreement is not designed to set up a cartel, regulate the domestic industry or attain any other of the undesirable objectives attributed to it, and that it does not require modification but merely clarification to make this definite and specific.

The very facts that full details of the agreement were made public within a few hours after it was signed and that President Roosevelt sent it to the Senate for ratification instead of putting it through personally as an executive agreement, they pointed out, demonstrate that the administration is anxious to insure that its arrangements are not considered adverse to the interests of the affected industries. Clarification of the terms of the agreement would be further evidence of this policy, and an acceptable treaty will ultimately be developed, it was declared.

U. S. Gasoline Taxes Hit Highest Total Since 1940

Federal gasoline tax collection in October touched the highest level recorded since November, 1940, with a total of $38,374,828, the Internal Revenue Bureau reported November 25.

The month's receipts were nearly $6,000,000 above the $32,930,915 secured in September.

Receipts from the tax on lubricating oils declined somewhat from September levels, amounting to $5,918,427 against $6,079,396, but were slightly above the $5,645,908 collected a year ago. Pipe line transportation taxes amounted to $1,400,157, against $1,420,931 in September and $1,342,187 last October.

For the ten months ended with October, gasoline taxes collected totaled $255,728,397 against $217,152,865 last year; lubricating oils paid $41,034,923 against $40,612,446, and pipe line transportation $13,547,047 against $11,725,810.

49.5-Mile, 20-Inch Line Given Approval of FPC

The Federal Power Commission has issued a certificate to the Memphis Natural Gas Company for the construction of additional facilities in Arkansas, Mississippi and Louisiana to permit it to meet the requirements of its customers at a cost of $2,553,000, of which $1,440,000 will be required for the building of a 20-inch line approximately 49.5 miles in length from the North Lisbon gas field in Claiborne Parish, Louisiana, to the company's Guthrie compressor station in the Monroe gas field, Ouachita Parish, and $1,113,000 will be for main-line looping.

Oil Products Received by Army in Burma-India by Reverse Lend-Lease

American forces in the Burma-India theater of war received 154,000,000 gallons of petroleum products from India under reverse lend-lease, President Roosevelt disclosed November 24 in his quarterly report to Congress on lend-lease operations.

Giving no figures whatever on lend-lease exports from this country, the report was devoted to a discussion of what the British have supplied in the way of reverse lend-lease. The President did not disclose how much gasoline was supplied us in the European theater of war by the British, but did reveal they supplied millions of "Jerri-cans"—five-gallon gasoline containers copied from captured German equipment in Africa and first used in the successful British campaign against Rommel—for use in the European invasion, supplied the pipe for a pipe line from Cherbourg to Paris, and have made close to 300,000 paper gasoline tanks to lengthen range of our planes, the tanks being dropped when empty.

The lack of figures on oil was explained as due to the manner in which that product is handled in the European theater of war. Petroleum products are shipped to the United Kingdom from both American and British sources and are pooled and drawn upon by American, British and Allied forces as needed. All of the gasoline and oil in the pool which comes from the United States is recorded as lend-lease aid to the United Kingdom. Withdrawals with an estimated cumulative value of $104,700,000 which have been made from this pool by United States air, ground and naval forces have been recorded as reverse lend-lease.

British contributions also include about 78,000 tons of crude rubber this year and, up to last June 30,700,000 gallons of benzol, required for the manufacture of aviation gasoline and synthetic rubber.

Reverse lend-lease oil products supplied in the Burma-India theater, from British oil resources, principally in the Middle East, included 113,309,000 gallons of aviation gasoline, 31,157,000 gallons of motor vehicle gasoline, 3,682,700 gallons of diesel oil, 2,651,000 gallons of aviation oil, 572,000 gallons of greases, 246,000 gallons of motor vehicle oil, 87,300 gallons of lubricants and 2,807,800 gallons of miscellaneous products, the President said.

Surplus Property Bidders' Eligibility Now Outlined

Very few members of the oil industry who have worked for the government during the war, either as military officers or civilians, will be barred from active participation in the acquisition by their companies of surplus war stocks and properties which are to be sold, under an opinion rendered by Attorney General Francis Biddle on the scope of Section 27 of the surplus property act of 1944.

That provision prohibits government employes who have been concerned in the disposition of surplus goods from acting as counsel, attorney, agent or representative of private interests for two years in connection with any matter involving the disposition of surplus goods by the agency in which they were employed.

The Attorney general's opinion holds that this prohibition applies only to persons who "ratified, approved or authorized" the disposition of surplus property or recommended such action as part of their official duties, and does not cover employes whose sole duties were to "survey" property to determine whether it should be declared surplus, or who ratified, approved or authorized the determination that property should be declared surplus but did not also authorize its disposition.

The ruling will relieve the minds of many members of the industry who have been associated with the War, Navy or other departments which have goods and properties to be disposed of and who feared the law might be applied to bar their companies from purchasing surpluses. The Attorney General also held that persons barred from engaging in the actual purchase of surplus stocks are not prohibited from becoming officers or employes of concerns making such purchases, although they may not themselves participate in negotiations with their former government agencies involving surplus property matters.

Large Purchases Petroleum Likely by Postwar France

Rehabilitation of French industry will require large purchases in the United States, estimates placing her needs in the first year after the war at $63,000,000 worth of gasoline and petroleum products and $5,000,000 worth of synthetic rubber and carbon black, among other things, it was disclosed last week in a review of the French situation by the Foreign Economic Administration.

Every effort will be made to obtain the return to private trade with a minimum of delay, it was promised by the FEA, but, because of the damage to transportation, port and other facilities and the necessity for using what facilities are available for supplying our troops at the front, at least six or eight months will elapse before it is possible to do business in anything like the usual sense of the word in France.

Internal problems of shipping and transportation are seen as making it essential for the French government to act as sole import purchaser for perhaps a year, and the French supply mission in Washington may remain for the duration of the economic crisis as the sole purchasing agent for France in this country, it was said.

While France has severe financial problems, the most serious being the flood of unbacked German occupation marks and the omnipresence of the black market, she has large gold reserves and dollar balances in this country and elsewhere which will give a start toward rebuilding French economy and commerce, FRA stated.

Wooden Barges Are Termed Adequate by Government

Test performance on the Gulf Intracoastal waterway last week brought from the Office of Defense Transportation a verdict that the government-owned wooden tank barges are adequate for the service in which they are engaged.

A total of 84 such barges, working with 21 tugboats, are now in canal service, transporting Navy special fuel oil eastward from Texas refineries.

Built to supplement the steel-barge program, restricted by the lack of metal, the wooden barges will remain in service as long as required, it was announced by Lawrence C. Turner, head of the waterways transport department. Turner disclosed that preliminary tests of the barges showed the need for modification by lengthening the stripping pipe and adding new water-proofing to the decks, which was done last winter, and they have since proved satisfactory. Each of the barges will carry 500 barrels of residual oil, and operate in units of four, pulled by one tugboat.

Gas Measurement Course Scheduled April 17-19

April 17-19 are the tentative dates for the Southwestern Gas Measurement Short Course at the University of Oklahoma, Norman, it was announced by Earl Knightlinger of Arkansas Louisiana Gas Company, chairman of the general committee.

The following committee chairmen were also announced: C. A. Gibson, Cities Service Gas Company, Bartlesville, Oklahoma, program; R. M. Schofield, Lone Star Gas Company, Dallas, exhibits; Miss Kate A. Niblack, Oklahoma Utilities Association, Oklahoma City, registration and publicity; Dean W. H. Carson, College of Engineering, University of Oklahoma, banquet; entertainment and local arrangements; W. H. Woods, Gulf Oil Corporation, Houston, study of practical methods.

William D. Yale, The Texas Company, Houston, was named to the general committee, replacing Max K. Watson, Canadian River Gas Company, Amarillo, Texas, who will become a member of the executive committee.

Loops Are Aproved

The War Production Board has approved an application filed by the Texas-New Mexico Pipe Line Company to construct seven 12-inch loops aggregating 30.2 miles at various hydraulically unbalanced points along its trunk line route from West Texas to Houston. Construction work is starting this month, to be completed in December or January. Second-hand pipe will be used in constructing the loops.

Further Butane Ban

Stocks of butane and butane-propane gas are so tight that PAW last week imposed a prohibition upon further applications to install equipment for their use for cooking or heating.

The shortage, due to increased requirements for 100-octane gasoline, last month necessitated issuance of an order prohibiting the use of butane gas in drilling operations where natural gas was available.

Contamination of Game Refuges Banned in Rules

Strict regulations were issued last week by the Interior Department for the exploitation of oil reserves underlying national wildlife refuge lands, requiring that exploration, drilling, development and transportation of oil, and the control of abandoned wells or wells taken out of production, shall be conducted in such way as to avoid pollution or contamination of the refuges.

All operations on the refuges are to be carried out with a minimum of human occupancy, housing facilities and structures, and pumping, pipe line and other equipment must be so confined as to prevent the escape, leakage or waste of oil that might otherwise occur as a result of rains or high water.

Suitable provision must be made for the removal of oil field brine from the area, by pipe line or other approved method, so as not to contaminate the lands or the water in ponds or lakes, and operators will be held responsible for damage which may result from the leakage or waste of oil, brine or other field contamination.

Holders of Interior Department permits on these lands are not to interfere with any fence, signboard, or improvement or facility of the United States in the reservations.

Pennsylvania Corporation Hearing Set November 27

A hearing has been scheduled by the FPC for November 27, in Washington, on the application of the Manufacturers Light and Heat Company, a new corporation, for authority to acquire and operate all the facilities of five subsidiaries of Columbia Gas and Electric Corporation.

The five companies—Manufacturers Light and Heat Company, Greensboro Gas Company, Manufacturers Gas Company, Pennsylvania Fuel Supply Company and Fayette County Gas Company—are engaged in the production, purchase, transmission and distribution of natural gas in western Pennsylvania, and in addition the old Manufacturers Light and Heat Company operates in Ohio and West Virginia.

The commission announced last week that it had authorized the New York State Natural Gas Corporation to acquire facilities it now operates under lease from the Peoples Natural Gas Company, including about 89 miles of 12-inch pipe line from Clarion County, New York, to Potter County, Pennsylvania.

Three Sons of Oil Men Missing on Same Bomber

Three sons of Tulsa oil executives were aboard the bomber, "Take Me Back to Tulsa," missing in the Mediterranean theater since October 29, according to the War Department.

The flyers are Second Lieut. Floyd N. Martin, formerly with Sunray Oil Corporation and a son of F. L. Martin, vice president of Sunray; Second Lieut. Sidney R. Davis, petroleum engineer and pilot of the plane, whose father, S. H. Davis, is an independent oil operator; and Second Lieut. William J. Connelly, former employe of the Larkin Torpedo Company, of which his father, E. J. Connelly, is secretary-treasurer.

Three-Mile Depth Exceeded in Well

Standard Oil Company's KCL-20-13, was drilling ahead on November 22, at 15,976 feet, and continues to hold the record as the world's depest well, by 697 feet. During the week from November 17 to November 22, drilling progressed 88 feet. The well is located in Kern County, California.

At the November 22 depth it was 136 feet below the 3-mile mark.

Clark Named Chairman of Continental Exploration

Appointment of S. K. Clark as chairman of Continental Oil Company's exploration committee has been announced by President Dan Moran. He succeeds R. E. Collom, who will devote full time to his duties as vice president in charge of Continental's California operations.

S. K. Clark

Clark is well known in scientific circles, having contributed to the Journal of Geology, and to publications of the American Association of Petroleum Geologists. He has done much research in logging rotary wells from drill cuttings.

From 1919 until 1924 Clark was associated with several oil companies in Oklahoma and Kansas, joining Continental in July, 1924, as a geologist. He was made assistant chief geologist in 1932.

Accountants Organize

The Petroleum Accountants Society of Dallas, Texas, was organized recently and will meet on the third Thursday of each month. Purpose of the meetings is to hear lectures by eminent tax authorities, and to engage in round table discussions of tax problems peculiar to the oil business.

Officers include: Sam Thompson, H. S. Moss Petroleum Company, president; W. F. Pope, Sun Oil Company, vice president; J. H. Jukes, Great State Oil Corporation, secretary; John Hall, Placid Oil Company, treasurer. Directors are V. D. Bostick of W. L. Pickens Company, program; and Ken Milligan, Renwar Oil Corporation, publicity.

Texas Geologic Map

A new geologic map of the Guadalupe and Delaware Mountains of West Texas has been published by the Geological Survey, showing the various formations and structural features of an area of about 360 square miles in western Texas immediately south of the New Mexico boundary.

Copies of Preliminary Map 18 of the oil and gas investigations series may be purchased from the Geological Survey at 40 cents each.

Restriction Relaxations Are Summarized by PAW

Recent relaxations in restrictions on the use of steel plate, aluminum and other materials of importance in the oil industry were summarized last week by PAW, as follows:

Restrictions on the use of steel sheet, copper alloys and other materials which have been modified will apply only to operations covered by PAW Form 30.

Modifications are contained in a revision by the War Production Board of Schedule D to Preference Rating Order P-98-b, which sets forth the principles governing wartime construction and the specific limitations that must be followed in undertaking construction operations covered by PAW-30.

Revisions to Schedule D do not alter provisions of PAO-11, PAO-12 or PAO-15, nor do they eliminate the necessity of applying for permission to use materials for construction of essential products in cases where it is required by those orders.

Change in construction standards incorporated in the revised schedule represents a relisting of recent changes in WPB's materials controls into a single document for the convenience of the oil industry.

Under the revisions, restrictions of Schedule D are eliminated on the use of steel plate, metal lathe, aluminum and hardware for the construction operations covered by PAW-30. All restrictions on plumbing and heating applications also are eliminated.

Restrictions are relaxed, but not eliminated, on the use of steel sheet, steel strip, rails and craneways, and copper and copper-base alloys for PAW-30 operations. The revised schedule also permits the use of materials in electrical work for most purposes and somewhat modifies restrictions on the use of lumber in oil industry operations.

Contractors Advised to Prepare for Termination

Contractors working on products for the Army are being urged by the War Department to undertake pre-termination planning in anticipation of the day when their war operations will be halted and to enter into agreements regarding the disposal of government-owned inventories which can be put into storage until the time of termination.

Pointing out that many specific questions must be dealt with in each case where a contract is halted in advance of its completion, department officials are warning their contractors that war contracts may be terminated at any time, often with little advance notice, and contractors may save themselves some headaches by preparing now as far as possible for that eventuality.

It is explained that there are a number of points which can be settled at any time prior to termination of a contract, including what type of raw material the contractor wants to retain or to sell; what the government needs for other contractors; what price per unit the contractor will pay for termination inventory, raw materials or supplies the government does not need; what percentage of profit is fair and reasonable, and what financing the contractor will need to tide him over between the termination and settlement of his contract.

Further Delay Seen in Settlement of Humble's Ingleside Injunction Case

Department of Justice attorneys on November 23 were given 10 days in which to reply to a brief submitted by Humble Oil & Refining Company in the Fifth Circuit Court of Appeals sitting last week in Fort Worth in connection with a temporary injunction previously granted by Judge W. H. Atwell against seizure of Humble's Ingleside refinery.

The Department of Justice had contended that Atwell's court had no jurisdiction over the persons of defendants named who are domiciled in Washington and that the case was now moot, inasmuch as sanctions applied against the company to force insertion of the maintenance of membership clause in its contract with the CIO had been withdrawn and that all applications had been processed.

Humble counsel replied that the case is not moot since the WLB order requiring insertion of the clause is still in effect, and that the sanctions were not withdrawn until after Humble had already obtained a temporary restraining order. Humble further contended that while the court did not have jurisdiction over persons in Washington, it did have complete jurisdiction over their representatives in Texas, and would have jurisdiction over anyone sent, or who comes from Washington acting for them.

Humble's attorneys pointed out that the suit is not against the United States but against officers acting outside their authority and contrary to the law, and that the court had jurisdiction over the entire controversy.

Although not directly applicable to this particular action, an interesting development is the report that the bargaining agency on November 16, voted 187 to 119 in favor of a strike at Ingleside. Union representatives announced that the strike would not be called if Humble agreed to insert the maintenance of membership clause in its contract. They said that the vote was indicative, not of a desire to strike, but as an expression in favor supporting the government in the issue. Actually the government can take the plant over only in the event of stoppage of work.

Aid for Small Business in Postwar Era Taking Shape

Federal aid to little business during the reconversion period may take the form of financial assistance, under legislation now being drafted for consideration by Congress.

Pending before the Senate small business committee, the legislation would extend the life of the Smaller War Plants Corporation until July 1, 1947, retitling the agency the Small Business Corporation. Heretofore devoted to insuring that small companies participating in war production contracts, the corporation in the immediate postwar period would be given authority for a maximum of $100,000,000 to be used for loans to small concerns to tide them over the period of settlement of their government contracts, assist them in the purchase of gevornment surplus stocks, and provide them with capital to reconvert from war to peacetime operation.

The proposed legislation carries a broad definition of a small concern, placing in that category any company employing less than 500 workers in manufacturing, mining, transportation or the repair and maintenance of production equipment. The Small Business Corporation would be empowered to make, guarantee or participate with any bank or financial institution in loans, discounts or advances to organizations unable to obtain funds from private or commercial sources.

Named Sinclair Executive

Sheldon Clark has been named chairman of the executive committee of Sinclair Oil Corporation to succeed the late E. W. Sinclair.

Clark formerly was vice president of Sinclair Refining Company and a vice president and director of the parent organization. Albert E. Watts has been named vice president of the company, and Watts and Leland V. Stanford have been named to the board of directors.

George H. Taber, Jr., has been elected president of Sinclair Refining Company.

Handbook on Oil and Gas Conservation Being Readied

A simplified handbook on oil and gas conservation is being prepared by the interstate relations committee of the Interstate Oil Compact Commission.

With members from nine oil producing states, headed by Oklahoma's former governor W. J. Holloway, Oklahoma City, the committee was recently commissioned to prepare the handbook which is being so written that conservation measures will be stripped of their seeming technical perplexities, and the fundamental principles and benefits of true conservation may be readily understood. The book will be distributed to legislators, public officials, industry members and others in potential, as well as present, oil producing states as a part of the commission's nation-wide educational program.

Members of a sub-committee appointed to engage in the actual preparation of the manuscript, will meet in New York City soon to finalize the draft of the book. Attending the collaboration conference with Holloway will be Earl Foster, Oklahoma City, newly appointed commission secretary; R. B. McEntire, Topeka, chairman of the Kansas Corporation Commission, and Ted Knoop, committee secretary.

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CORP. EMMETT H. DALY, JR., 30, of Tulsa, formerly with Stanolind Pipe Line Company, and son of E. H. Daly, Sr., president of Papoose Oil Company, Tulsa, was reported killed in action in France October 29.

Congress May Investigate Resignation of Littell

A congressional investigation of a row in the Department of Justice which culminated in a request by Attorney General Francis Biddle for the resignation of Norman M. Littell, assistant attorney general heading the lands department, was in sight this week.

The investigation was promised by Senator Harley M. Kilgore of West Virginia, chairman of the Senate war investigating committee, who explained that Littell furnished a great deal of information in hearings of the committee when it was headed by Senator Truman, and it is highly undesirable that the committee permit witnesses to be punished for testifying before it.

Littell, with the department for five years, has been one of the leading liberals in it. His activities in the past have brought him into contact with the oil industry frequently, first during the extensive investigations into the West Coast oil business which he made for the government in connection with the operations of the National Recovery Administration and more recently when his disclosures of the original contract between the Navy Department and Standard Oil Company of California for development of the Elk Hills reserve led to its cancellation and a new agreement.

Gasoline Gum Inhibitors Put Under Allocation Order

The War Production Board has placed gasoline gum inhibitors under the general allocation order and has announced that allocations will be on a monthly basis with a small order exemption of ten pounds of each inhibitor.

Under another order, distributors of Petroleum equipment other than for refining purposes who were in business in August 1, 1943, and who sold copper tubing for repair purposes in 1941 may now obtain copper tubing for use in repairing such equipment.

Phillips Official Resigns

Col. Russell M. Riggins resigned as treasurer of Phillips Petroleum Company to engage in independent business practice, and was succeeded by B. F. Stradley, who also continues as secretary of the company. Riggins, who recently was granted a release from active duty, joined Phillips in 1930 at the time of the Independent Oil and Gas Company merger and served as comptroller until 1938 when he became treasurer. He obtained a military leave of absence in 1942 and went to Washington, D. C., as chief of the depots and facilities division as well as chief of the control division of the ordnance department.

Fuel Oil Tight

Another warning that fuel oil supplies will be tight this winter and that no relief from rationing is in sight was issued by the government last week.

In a survey of the whole fuel situation, the Office of War Information said that the limited improvement which has been accomplished in East Coast and Midwest stocks of fuel oil are not sufficient to warrant any increase in the present ration, while in the Pacific Northwest the situation has deteriorated and continued strict control will be necessary.

Texas Allowable for December Set At Total of 2,284,958 Barrels

A December allowable of 2,284,958 barrels, which is 6958 barrels in excess of demand as reported by PAW certifications, was fixed for Texas by the Railroad Commission after a statewide hearing held in Austin last week. The new figure is 2446 barrels less than the allowable on November 18. It includes 149,980 barrels of distillate and natural gasoline.

The commission ordered that fields generally shall produce for 24 days in December. East Texas is to produce 24 days and the Panhandle is exempt from shutdown. There were few changes in field allowables. Coke was raised from 2158 to 2436 barrels, Todd Deep from 380 to 1200, Yates reduced from 39,706 to 37,076 and the Ellenburger wells in the Keystone field were raised from 1400 to 2400 barrels daily.

PAW's recommendation, unchanged at 2,278,000 barrels per day, continued a request for 462,000 barrels of West Texas and 22,000 barrels to be delivered to the Big-Inch pipe line.

Producers' nominations totaled 2,320,562 barrels which was 6766 barrels higher than the November total. In East Central Texas nominations dropped 11,699 barrels but in West Texas was up 12,802 barrels. The Gulf Coast district increased 2083 barrels.

H. P. Nichols, executive vice president of East Texas Oil Association, in a prepared statement criticized THE OIL WEEKLY because of a November 6 article by Editor Warren L. Baker, discussing failure of the commission to increase the allowable for East Texas. He said the article unfairly and unjustly criticized the commission's effort to conserve bottom-hole pressure in East Texas, his charge being that statements made therein differed decidedly from "our poll of what independent operators believe to be the most efficient withdrawal rate for the field."

Profits and War

"I wonder if Mr. Baker arrives at his conclusion from a poll of the large integrated companies?" he asked. "There is no doubt these companies would prefer to operate on sweet crude because it results in larger profit."

Nichols thought the railroad commission should use the same yardstick for East Texas as it does for West Texas. He also reminded the commission that it had heard "for about two years" the argument that "East Texas crude is necessary to win the war." "Yet these same purchasers who are again clamoring for more East Texas crude have done a first-class job of refining crude from other fields and our war effort seems to be in a very satisfactory condition at this time."

Nichols' statement also touched on salt-water injection to maintain pressure and said that "while successful to date, is subject to future repercussions. Some believe the west side producers may have suffered financially and the future of east side producers is questionable because as the water is injected along the west side, the gas will be driven eastward and will finally displace the oil in east side wells. If the gas should pass out of solution tomorrow, the field would not produce 200,000 barrels daily. . . . East Texas stands as a monument to conservation efficiently administered."

Culberson Replies

Commissioner Olin Culberson said the magazine was within its rights to criticize commission policy, calling "constructive criticism not only a prerogative of the press but its sacred duty. Criticism is the best stabilizer that I have encountered. I read THE OIL WEEKLY article with interest. It is helpful to get the opinion of others."

Another statewide proration hearing has been set for December 19.

Comparative allowables by districts for November 1 and December 1 are shown below:

DISTRICT	Nov. 1 Net Allowable	Dec. 1 Net Allowable
1. Southwest Texas	25,045	24,535
2. Southwest Texas	170,452	181,066
3. Gulf Coast	554,290	548,998
4. Southwest Texas	226,396	222,261
5. East Central Texas	45,385	44,032
6. East Central Texas	114,214	110,924
East Texas	374,632	377,289
7-B West Central Texas	36,323	30,857
7-C West Central Texas	23,535	23,773
8. West Texas	484,463	476,645
9. North Texas	152,970	137,801
10. Panhandle	120,385	113,498
	2,325,090	2,291,979
Less Underproduction	186,705	157,001
	2,138,385	2,134,978
PAW Crude Oil Certification	2,133,000	2,133,000
Texas Over in Crude Oil	5,385	1,978
Distillate and Natural Gasoline	146,918	149,980
Total for State	2,285,303	2,284,958
Total PAW Certificate	2,278,000	2,278,000
Texas Over	7,303	6,958

Gulf Coast Area to Get Absorption-Type Plant

Glenn H. McCarthy, Incorporated, has started purchasing materials for construction of an absorption-type gasoline plant for the processing of gas drawn from the Stowell, Winnie, North Winnie, and possibly other fields in the northern Chambers-Jefferson County area. Stone and Webster have been awarded contract for constructing the installation at an estimated cost of $4,000,000 and which may be ready to begin operations in December. The plant will have a through-put capacity of 45,000,000 cubic feet of gas daily, and will operate at 450 pounds pressure. Under the present design it will produce motor gasoline, butanes, pentanes, isobutanes, isopentanes, and propanes. After processing, the gas is destined to move to the Beaumont-Port Arthur area for domestic and industrial use.

Bay Petroleum Purchases Properties of Chalmette

Ownership of Chalmette Petroleum Corporation has been purchased by Bay Petroleum Corporation, Denver, for consideration of more than $1,000,000, but operations of Chalmette will be continued under the same name. Chalmette properties include a 9000-barrel refinery near New Orleans, barge loading terminal on the Mississippi, tank car and tank truck loading facilities, and a 750,000-barrel capacity tank farm on 55 acres.

Bay Petroleum expects to open production offices in North Louisiana or Mississippi, has producing properties in Illinois, Texas, Kansas, and New Mexico, and operates refineries at Denver and McPherson, Kansas. Charles Ulrich Bay, New York, head of Bay Petroleum, is chairman of the board of Chalmette Petroleum, and other new officers of Chalmette include Roland V. Rodman, president; C. O. Garbrecht, vice president; Dent N. Hand, secretary-treasurer; L. L. Leabo, director of sales; and L. E. Vivien, general manager.

Production Shows Gain Over the Previous Week

United States production of crude oil averaged 4,748,330 barrels daily during the week ended November 25, reports to THE OIL WEEKLY showed. That rate of output was 13,225 barrels a day higher than production in the previous week, and within about 20,000 barrels of the all-time peak reached in September.

Outstanding among the fluctuations by states was the increase in Illinois production to 211,100 barrels daily from 189,700 daily the week before. And the only other important change was a decrease in Kansas to 274,200 barrels daily from 282,700 the previous week—a decrease which only partly canceled the substantial increase in Illinois. Other states were unchanged or showed only slight difference in producing rate from that in the previous week.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED Nov. 25	Nov. 18
Alabama	300	300
Arkansas	80,450	80,750
California	883,425	884,600
Colorado	9,800	9,800
Florida	50	50
Illinois	211,100	189,700
Indiana	12,550	13,150
Kansas	274,200	282,700
Kentucky	30,400	30,350
Louisiana	363,550	363,150
North Louisiana	72,250	71,850
South Louisiana	291,300	291,300
Michigan	49,800	50,000
Mississippi	52,950	52,550
Missouri	100	100
Montana	22,870	22,720
Nebraska	950	1,000
New Mexico	105,750	105,750
New York	13,750	13,500
Ohio	7,900	7,600
Oklahoma	357,300	358,000
Pennsylvania	36,400	36,750
Tennessee	35	35
Texas	2,132,300	2,132,300
Upper Gulf Coast	553,350	553,350
East Texas Field	367,950	367,950
Rest of Eastern Texas	144,600	144,600
Lower Gulf Coast	247,600	247,600
Southwest Texas	79,300	79,300
South Central Texas	20,150	20,150
West Texas	473,950	473,950
North Texas	151,200	151,200
Panhandle	94,200	94,200
West Virginia	8,700	8,100
Wyoming	93,700	92,150
Total United States	4,748,330	4,735,105

Much Legally Vented Gas To Be Purchased by TGT

Asserting that saving and utilizing the waste gas in the numerous gas fields of Texas is the final answer to gas conservation, officials of the Tennessee Gas and Transmission Company stated that it is planned to buy waste gas in the fields through which their new line passes. At an appreciation dinner given by the company in Houston, Texas, recently, Richard Wagner, of Chicago, chairman of the board of the company, declared that Texas land owners and the state treasury will profit by the line which will carry much gas formerly wasted or "legally" vented.

"Studies we have made," said Wagner, "show that in the 360 miles which we traverse in Texas there is now being vented daily over 200,000,000 cubic feet of gas within a distance of 10 miles of the line. Not all this gas can be saved economically, but at a price of five cents a thousand, much of it can and should be saved."

Gardiner Symonds, president, was introduced as "the one man personally responsible for getting the line completed in record time of 10 months."

About 400 contractors, friends, principal suppliers and members of the company attended the dinner. The line, recently completed, extends from Corpus Christi, Texas, to West Virginia.

Drumright Chapter API Picks Officers for Year

J. A. Huitt, shop superintendent, Deep Rock Oil Corporation, was re-elected president of the Drumright chapter, division of production, API. J. H. Fields, engineer for Gulf Oil Corporation, was named first vice president, and Guy Furman, Eureka Tool Company, second vice president. D. J. Preston, Continental Supply Company succeeds Fields as secretary-treasurer.

H. R. Rockhold, superintendent, the Gulf, at Drumright, was named chairman of the advisory committee succeeding W. L. McCormick, retired superintendent of Gulf, who remains on the committee. Other members include H. S. German, Cities Service Oil Company; W. L. Moody, Deep Rock, Cushing; Oscar Anderson, Oilton; Grover Stout, Comail Oil Company; Stanley Donnelly, The Texas Company; Ray Wilson, Magnolia Petroleum Company; R. W. Bond, Tide Water Associated Oil Company; George Heape, The Pure Oil Company; John W. Stoker, Sinclair Prairie Oil Company; E. B. Gilliam, Mid-Continent Petroleum Corporation.

Mississippi-Alabama Officers Are Announced

The Mississippi-Alabama Division of the Mid-Continent Oil & Gas Association has completed its organization. A board of directors has been chosen, officers have been elected, and affiliation with the Mid-Continent Oil & Gas Association has been effected.

Officers of the organization are: C. L. Morgan, Dixie Geological Service, Jackson, Mississippi, president; W. M. Vaughey, Vaughey and Vaughey, of Jackson, vice president; Buford Yerger, Mississippi Bankers Association, of Jackson, acting secretary.

Tax Review

A New Feature of THE OIL WEEKLY

By WILLIAM O. TAYLOR*

This column will review legislation, judicial decisions, administrative rulings and policies, and topics which are of current interest to the oil industry from a tax viewpoint. It will be published as frequently as new developments seem to require. The column first appeared in THE OIL WEEKLY of November 20, 1944, page 29.—*Editor.*

Question of Revenue Stamps on Mineral Leases Raised Again

THE question of whether a mineral lease is real or personal property (see THE OIL WEEKLY, November 20, page 29) has been raised before in connection with federal taxation. Sections 3480 and 3482 of the Internal Revenue Code impose a tax in the form of stamps to be put on deeds or written instruments transferring "lands, tenements, or other realty sold," if the consideration or value of the property transferred exceeds $100. For years, the Bureau of Internal Revenue required stamps to be put on mineral leases only if the interest acquired by the lessee was considered real property under the applicable state law. *G.C.M. 23295*, a ruling published in 1942, stated that if the property involved had certain characteristics, it would be treated as realty for stamp tax purposes regardless of state law. All prior rulings holding mineral leases exempt were revoked by *G.C.M. 23295*.

The Mid-Continent Oil & Gas Association has filed an excellent brief with the bureau, contending generally that the code provisions do not apply to mineral leases and specifically that they do not apply to Oklahoma and Kansas leases. It is shown that leases in those states do not constitute sales and that the interest acquired by the lessee is not realty. If the bureau is persuaded to change its position with respect to Oklahoma and Kansas leases (the association has had excellent results with briefs on other questions), it would follow that local law would again control in other states.

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Advantageous Provision With Respect to Liquidation May Not Be Availed of After December 31, 1944

Not much time remains in which advantage may be taken of Section 112 (b) (7) of the Internal Revenue Code, under which a corporation may be liquidated, in certain instances, without unduly penalizing its shareholders tax-wise. The section was apparently enacted because it was recognized that, aside from other advantages and disadvantages, it is generally more advantageous tax-wise for relatively smaller business enterprises to be operated as partnerships or proprietorships rather than corporations under our present tax structure. Changing from the corporate form to one of the others would usually involve liquidation of the corporation. Under prior law, a shareholder of a liquidated corporation was treated as having sold his stock for an amount equal to the cash he received on liquidation plus the value of other property received. Where the property of the corporation had substantially increased in value since it was acquired by the corporation, the shareholder realized a taxable gain on what was often only a change in the form of carrying on a business. The hardship was particularly likely to occur in case of a corporation engaged in the oil business, where values of wildcat leases may be greatly enhanced by discoveries or development after the leases were acquired.

Under Section 112 (b) (7) the shareholders' gain on liquidation may be limited, in effect, to whichever of the following is the greater: 1) the earnings and profits of the corporation accumulated since March 1, 1913 (this is essentially the corporation's earned surplus), or 2) the amount of cash plus the value of certain stock or securities received by the shareholders. Since mere enhancement in value of a corporation's property does not increase its earnings and profits, the fact that the corporation has such property will not increase the tax to which the shareholder may be subject on liquidation, if it is accomplished under Section 112 (b) (7).

It should be understood that it is not necessarily more advantageous to liquidate under Section 112 (b) (7) than under other provisions of the code. Ordinarily, gains on liquidation are treated as capital gains, which is advantageous. Under Section 112 (b) (7) the recognized gain, to the extent of the corporation's earnings and profits, is treated as a dividend and is fully taxable, if the shareholder is an individual. Situations in which it will be advantageous to liquidate under Section 112 (b) (7) are, in general, limited to those in which the corporation has a relatively small amount of cash and little accumulated earnings and profits, but has properties which have substantially increased in value since acquisition.

A decision as to whether a corporation should be liquidated and in what manner it should be done will involve, from the tax standpoint alone, that at least the following additional factors be taken into account: 1) the status of the corporation under the excess profits tax; 2) the income brackets in which the owners will fall if the business is operated as a partnership or proprietorship; 3) how much the shareholder paid for his stock and how long he has held it; 4) other capital gains and losses, if any, of the shareholder during the year.

*The author is an attorney associated with the firm or Butler and Binion, Houston.

Oklahoma Hearing

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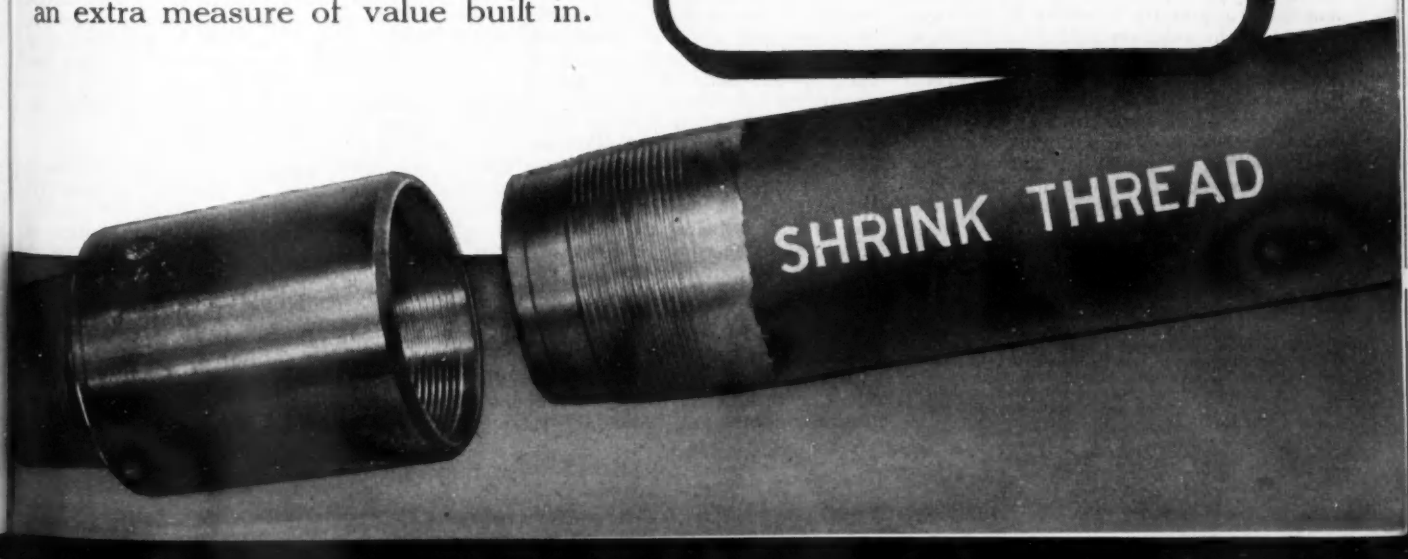

Control and Detection of Reservoir Gas Movement in Pressure Control Operations

By N. VAN WINGEN and E. P. VALBY*
Richfield Oil Corporation

THE important natural agents for effecting oil recovery that may be available originally in a reservoir are gas, both dissolved in the oil and free in gas caps, encroaching water, and the force of gravity. Which of these agents will be dominant for any given reservoir at any stated time period is dependent upon local natural and operating conditions. Hence, it is possible for a pool to pass from one dominance to another. For example, if flow is unrestricted in the early life of a field, the major mechanism will most generally be a gas drive. This may be followed upon the effective depletion of the free gas by a dominance of either a water drive or of gravity drainage.

Single or in Two Phases

Naturally occurring petroleum accumulations may exist either in a single phase or in two phases. Examples of the former are saturated or undersaturated oil (liquid phase only) or condensate pools (vapor phase only). A two-phase reservoir is one containing either gas and oil or oil and vapor, the latter case being exemplified by a condensate pool underlain by a dark oil zone.

Recovery is commonly effected by producing from wells within a reservoir either by natural flow or by artificial lift that petroleum which enters the well bore as a result of native reservoir energy or the force of gravity. Recovery is thus a direct function of the amount of expulsive energy available and hence, of the type mechanism which is dominant. Thus, for a single phase, liquid accumulation in a reservoir not subject to a water drive and consisting of sands so low in permeability that gravity drainage cannot be operative, the only natural energy available for recovery is that contained in the solution gas. As a result, a minimum recovery efficiency is to be anticipated for this type of reservoir. Conversely, the natural recovery efficiency will be a maximum when the solution gas energy is augmented by that contained in an overlying gas-cap in a water drive pool of sufficiently high permeability that gravity drainage can also be a factor.

Native reservoir energy may be augmented by the injection into the reservoir of either gas or water. It is evident that such a procedure should result in the attainment of a greater ultimate recovery. Operations of this nature may be resorted to early in the life of a field, in which event they are generally referred to in current terminology as pressure-control operations. The terms, pressure maintenance, as applied to a dark-oil reservoir and cycling for a condensate type pool, are also used often in lieu of the more comprehensive terminology. Augmentation of reservoir energy may also be instigated after a reservoir has reached its economic production limit by primary recovery methods, in which event the operation is referred to as a secondary-recovery process.

It is apparent that an efficient utilization of gas energy is essential to the attainment of a high ultimate oil recovery efficiency, particularly in those instances of either natural or stimulated production where gas is the major source of expulsive energy. It is to be noted, furthermore, that, in addition to its function as a displacing agent, gas also plays an important role by virtue of its solubility in oil by reducing the viscosity of the crude petroleum. This will increase the degree of mobility of the oil and promote its recovery efficiency. Hence, a knowledge of subsurface conditions adequate to effect an efficient control of gas movements within a reservoir is highly pertinent.

The problem of controlling gas migration is complicated by the fact that reservoir sands are seldom homogeneous nor of uniform permeability. Thus, in most instances, by-passing and fingering of gas will occur. This condition may be aggravated further by the existence of pressure anomalies due to a non-uniform production withdrawal pattern. Production of excess gas as a result of by-passing or fingering if unchecked, represents not only a loss in ultimate recovery due to this wastage of native reservoir energy, but may also cause the by-passing of substantial bodies of oil which after being denuded of their solution gas will remain non-recoverable unless the pool is subjected ultimately to a water drive or to gravity drainage. When dealing with a field where the native reservoir energy is being augmented by fluid injection, by-passing or fingering introduces the additional factor of economic waste represented by the cost of handling and compressing fluid to replace produced gas which has performed but little useful work within the reservoir.

Migration of gas can be influenced by selective production or, in the event of pressure control or secondary recovery operations, by the suitable location of injection wells and control of their injection rates. In view of the heterogeneity of most naturally occurring reservoir sands, however, this procedure will not suffice generally to control gas migration effectively over an extended period of time. Thus, whenever by-passing assumes significant proportions recourse has to be had, in most instances, to the performance of remedial work on individual wells for the purpose of shutting off the gas-bearing sand members. In this regard it may be highly significant if the source of the encroaching gas can be identified. If it can be shown, for example, that the gas being produced consists largely of by-passed injection gas, the situation may be remedied sometimes, and further gas expansion to other wells prevented, by changing the location of the injection well or by shutting off in the injection well the sand finger responsible for the by-passing. In such event, it is evident that a substantial saving in well repair costs can be realized, as compared with those incurred when a number of producing wells has to be worked on.

Because of the need for means of detecting the migration of gas or showing that by-passing of injected gas is occurring, there will be explained the physical indications of gas migration and present means of detecting the presence of injected gas. A brief description of a method of well effluent analysis to give the amount of reservoir fluids and injected gas in a well's production and a distribution of its gas production also will be included.

Reservoir Gas Movements

The physical indications of gas or vapor phase migration can be similar in nature for the liquid-phase reservoir or for the vapor-liquid phase reservoir. However, these similar physical indications may be the result of different types of movement of gas or fluids in each type of reservoir. It is well, therefore, to consider the physical indication, as shown by increasing gas-oil ratio, changes in tank oil gravity, and wet gas or well effluent composition for the various types of reservoirs.

Increased Gas-Oil Ratio

The first usual indication of the migration of gas is an increase in production gas-oil ratio; cubic feet of wet gas produced at standard conditions per barrel of tank oil. This should not be confused with a seasonal variation in the gas-oil ratio.

In a single vapor phase reservoir where a recycling process is being used, any migration of injected gas is reflected in the increased gas-oil ratio. However, this increase may not be proportional to the amount of injected gas being produced as its presence affects the retrograde condensation process by which the tank oil is produced.

In a single liquid-phase reservoir an increased gas-oil ratio is an indication of the migration of liberated solution gas or injected gas. For the latter case, the actual increase may be due to either injected gas or the resulting enrichment of injected gas by contact with residual oil left in the interstices of the reservoir sands. In the first case, there will be reduction in the amount of tank oil, and in the second, an increase in tank oil volume due to enrichment, per unit of original reservoir fluid.

In a two-phase reservoir, the increased

* A portion of the material for this paper, presented before the annual meeting of California Natural Gasoline Association, was taken from a paper given before the Los Angeles fall meeting of AIME petroleum division October 20, 1944.

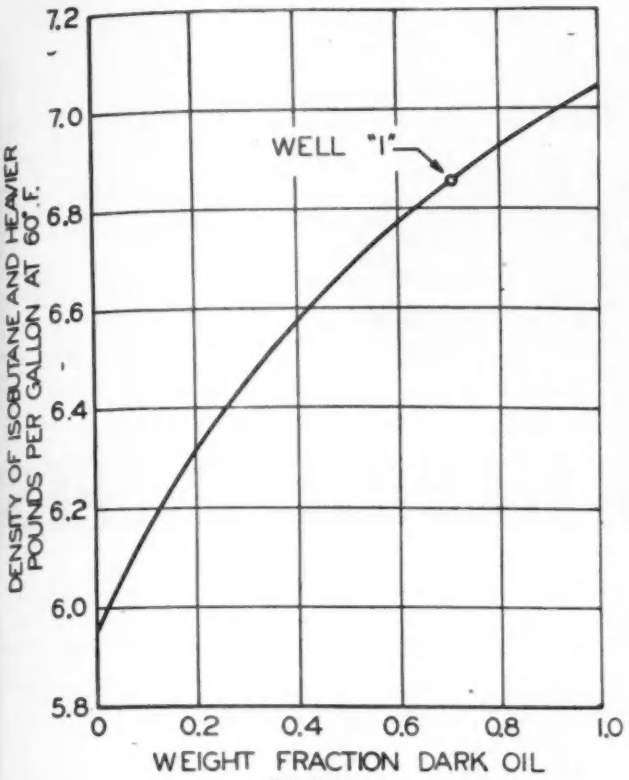

FIGURE 1

Weight fraction of dark oil in well effluent from density of isobutane and heavier.

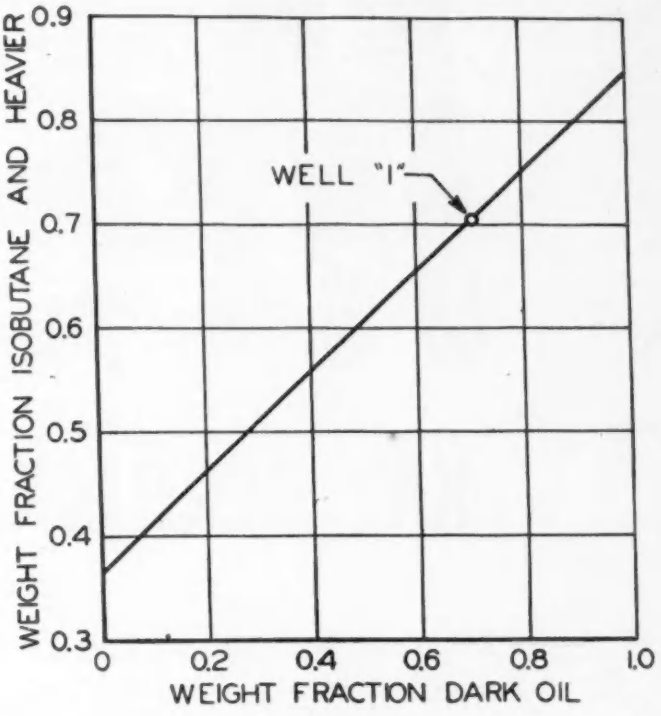

FIGURE 2

Weight fraction of dark oil in well effluent from weight fraction of isobutane and heavier.

gas-oil ratio can result from the movement of gas of two types, gas cap fluid (either original or secondary) and injected gas, separately, or a combination of both, and even the enriched injected gas alone.

Due to the fact that the increased gas-oil ratio may be caused by a number of different types of movements, it is not possible to determine the cause, or, approximate the amount of by-passed injected gas in the single liquid-phase reservoirs from gas-oil ratios alone. In a two-phase reservoir, it would be even more difficult to approximate the amount of injected gas being produced by a well.

Changes in Tank Oil Gravity

A second physical indication of possible gas migration is shown by the gravity of the tank oil. Here again, seasonal variations and surface trapping conditions affect the gravity of the tank oil.

Under cycling operations, the production of injected gas should result in a decrease of the gravity of the tank oil due to the stripping effect at trapping conditions and its effect on retrograde condensation.

The pressure maintenance by injected gas in a single-liquid phase reservoir can result in an increased tank oil gravity due to the stripping of volatile components of the residual oil at reservoir conditions, and mixing of these vapors with normal oil production. As this stripping progresses, the amount of volatile material will decrease and the gravity of the tank oil likewise decrease, eventually to that of the original tank oil. The gravity may even become lower due to this continued action, if the production of by-passed gas is not controlled. The first effect, increased gravity, may indicate the presence of a gas cap. Since for this type reservoir no original gas cap exists, qualitatively then, the increased gravity of the tank oil will confirm the migration of liberated solution gas or injected gas as indicated by the increased gas-oil ratio.

In a two-phase reservoir, an increased tank oil gravity may also be the result of the expansion of the original gas cap to a well bore completed in dark oil phase. However, the increase may also be due to the stripping effect of the injected gas on the residual dark oil, thereby enriching it and make it appear that the increased gravity is due to gas cap production. Thus, the increase in tank oil gravity offers no means of showing what process is occurring.

Composition of Wet Gas

The injected gas used for pressure maintenance in a producing reservoir is in most cases the residue gas from an absorption plant treating the wet gas produced by the reservoir. In such an event, there are no significant differentiating characteristics of the injected gas to aid its detection. If some other gas having decided differences in composition were used for pressure maintenance and the resulting produced gas were not recycled back to the reservoir, the changes in composition of the produced gas from that initially produced by the reservoir could be used to detect and determine how much injected gas was being produced. There are very few fields in which such a process of detection would be feasible.

The migration of gas cap fluid or injected gas to a well bore can be determined by changes in the composition of the well effluent—well effluent being the total production from a well bore—as shown by its analysis from time to time. This is due to the fact that the gas cap fluid has a higher percentage of the lighter constituents than the dark oil, and that the injected gas is generally composed of methane, ethane, propane, and only a small amount of the butanes. If, by comparison, the well effluent shows a decerase in certain fractions, a dilution effect caused by the entry of gas cap fluid, injected gas, or both, by migration to the well bore has ocurred. The change can be computed and would give a physical indication of any migration and the magnitude of the change over the period between analyses. This method would not indicate, however, if the change has been due entirely to an increase in gas cap fluid, enriched injected gas, injected gas, or a combination of the three to give the same certain fraction content in the well effluent.

It becomes evident then, although there are a number of physical indications that migration of gas cap fluid, enriched injected gas, or injected gas has occurred, that these indications in themselves do not permit an accurate determination of the respective amounts of migration to aid in detecting gas movements in the reservoir due to pressure control operations by means of injecting gas.

Methods of Indicating Migration

Methods in use and proposed have been to add gases, called tracers, foreign to the hydrocarbons in known proportions to the injection gas. By determining the amount of tracer in the gas produced by surrounding wells, it is possible to calculate the amount of injected gas being produced. The tracer can be added to the low stage intake of the compressor in which case all of the injected gas will contain the tracer. However, in some cases it may be desirable to add the tracer into the gas going to only one injection well. This would require means of introduction at high pressures, in some cases over 3000 pounds and pos-

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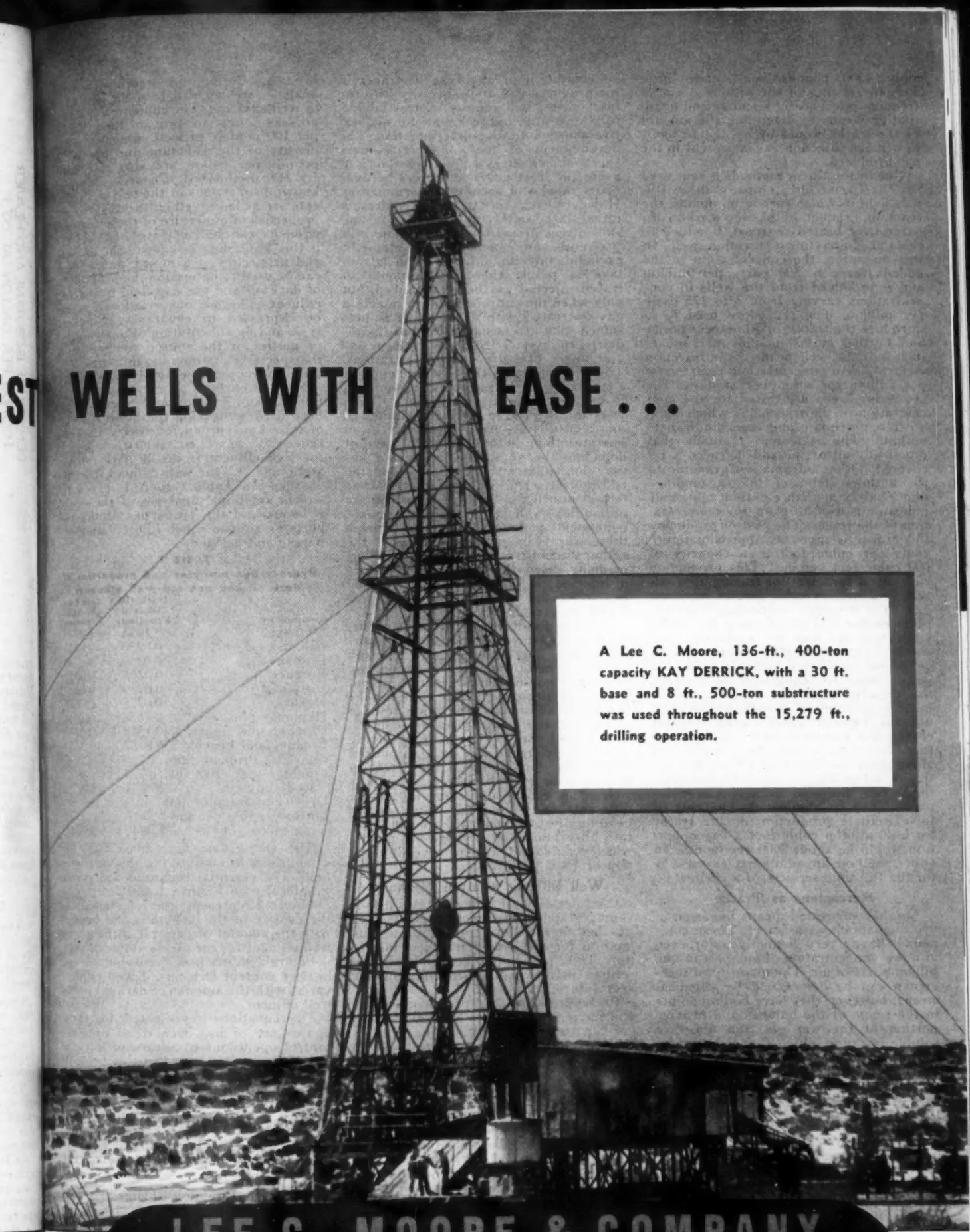
Total dead weight, calculated	221,316 lbs.
Calculated weight, considering buoyancy of mud	199,160 lbs.
Final casing string	5½"
Landed on bottom in	18½ hrs.
Total dead weight with letting in joint	312,414 lbs.

The Moore KAY DERRICK used on this well had been used on several other wells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sibly 4500 pounds per square inch. Periodic testing of the produced gas at frequent intervals by sensitive and quantitative means to determine the amount of the tracer would be needed to show how much injection gas is present in the gas produced.

One of the tracer methods is that used by The Carter Oil Company[1] in an Illinois field in which carbon monoxide, the reaction product of passing carbon dioxide over heated charcoal, is added to the gas going to an injection well. In this operation, the concentration of the added tracer is 500 parts per million and is produced from the wells in concentrations varying from 3 to 175 parts per million. The procedure used is to introduce the tracer, of 70 percent purity and bottled at 900 pounds per square inch into the well head of the injection well to give a concentration of 500 parts per million for a number of days. The producing wells are tested for the concentration of the tracer gas which build up to a maximum and then diminish to nothing. The statement is made that practically all of the added tracer is recovered. Other information available to the authors indicates that a modified mines safety appliance carbon monoxide indicator is used to show the concentration of the tracer. The cost of producing this tracer is given as approximately 6 cents per cubic foot at a capacity of 600 cubic feet per day. This production capacity is sufficient for tracing approximately 2 million cubic feet of injection gas. If a pressure maintenance project requires the tracing of, say, 20 million cubic feet per day, the operating cost would be about $11,000 a month, which would be prohibitive, and also, require a large outlay for equipment to produce the required amount of tracer gas. A possible economical method would be to use the exhaust gases of an internal combustion engine using a rich-fuel mixture. By compressing the exhaust gas along with the field wet gases, thereby tracing all of the gas to all of the injection wells, the cost of a special compressor can be eliminated. The cost of this alternate production of the tracer for a 20 million cubic foot a day operation would be about $600 per month. In either method an additional expense is for the full time services of a chemist.

Mercaptans as Tracer

Another suggested means has been to use mercaptans as a tracer. These compounds have a very distinctive odor, even at a low concentration of one part in one billion parts of air. The quantity of mercaptan can be determined by chemical means; however, they have boiling points in the range of the butanes and heavier portion of the wet gas and also are soluble in crude oil, so that it might be necessary to test the trap fluid as well as the wet gas to determine the amount of mercaptans in the well effluent. In one case where ethyl mercaptan was used, the odor was noticed in the production from edge wells where injection gas was not expected by evidence of no increase in gas-oil ratios. It is thought that the mercaptans diffused through the oil sands to the outer edges of the reservoir. If this is the case, and also because of its obnoxious odor around the producing field, the use of mercaptans for the tracing of injection gas is not advisable for continued use. It might be suitable for a single test in small quantities.

Other types of tracers used and suggested have been nitrogen, helium, carbon dioxide and related gases. The low concentration of any type of tracer in the produced gas, and especially with the inert gases, will require special laboratory apparatus and technique for qualitative and quantitative deterimnation. The development of the commercial mass spectrometer offers a good possibility of using the inert gases as tracers because of its rapid and accurate determination. However, this instrument requires a rather large outlay for installation and skilled technicians for its operation.

The above-mentioned tracer methods, excluding mercaptans, have the advantage of telling the actual amount of traced injected gas being produced, but only when the entire amount of injection gas is treated with a tracer. It is presumed that a considerable time is required to displace the fluids in the reservoir under pressure control operations. To be certain that the first evidence of a tracer gas in the production is noticed, it will be necessary to make periodic tests for the tracer for a long time. In many cases pressure control may be in operation long before the actual need of detecting the migration of injected gas may be apparent, in which event the addition of a tracer to the injection gas is not immediately started. Further, the difficulties in delivery of the required equipment and test apparatus during these war years may have delayed the actual start of tracing injected gas. Thus in many cases, there are large volumes of injected gas that have not been traced and which are now possibly being produced undetected.

Another disadvantage is that a producing field may have separate zones requiring various degrees of pressure control. Commingling of the gases for processing and compression then preclude the introduction of a tracer into one zone for the tracing of subsurface migration from it to another zone under pressure control. The second zone will then be receiving a portion of traced gas being produced by the first zone and thus the detection of inter-zone migration be made impossible. This can be overcome by adding different tracers to each zone, or by handling the gas from each zone in separate absorption and compressor plants, which would lead to expensive duplication of plant facilities.

Well Effluent Analysis Method

Consideration of some of the disadvantages and limitation of using tracers has led to the development of a new method for the detection of gas migration. This is to be more completely described before another meeting in the near future.

Presupposing that a producing reservoir having two sources of production, a gas cap area and a dark oil ring, both of uniform but different composition, is being subjected to pressure control operations to the extent of maintaining pressures above the saturation pressure of the dark oil by the injection of a residue gas substantially free of butanes. It is further assumed that such a field will first produce dark oil, then a mixture of dark oil and gas cap fluid, and then both of these two along with injected gas that will be enriched from the dark oil fluid as a whole. Relationships expressing certain properties can be developed from the composition and properties of the two sources and injected gas.

By use of production data and the fractional hydrocarbon analyses of the wet gas and trap fluid for wells producing exclusively from either the gas cap or dark oil ring, the weight fractional analyses are calculated for the two types of well effluents. The cubic feet at standard conditions of propane and lighter per 100 pounds of well effluent and the density of the isobutane and heavier in pounds per gallon are also calculated. By the method of mixtures, in which known proportions of the two well effluents are added together, the analysis and properties of a mixture of these two well effluents can be calculated. Conversely, if this basic data is known, the analysis and properties of a mixed well effluent can be used to determine the proportions of dark oil and gas cap fluid in the well effluent. The various relationships can be expressed in equations of general type, and by substitution of analyses and properties of the source well effluents, the specific equations for mixtures from these sources can be developed.

For the purpose of numerical illustration, data of Dodson and Standing[2] has been used to develop the basic equation of an assumed producing reservoir. Their crude "B" has been taken to represent the well effluent from the dark oil ring and crude "C" the well effluent from the gas cap. In Table 1 there is given the weight fractional analyses of these well effluents and the properties of the two portions propane and lighter, and isobutane and heavier.

TABLE 1

Hydrocarbon analyses and properties of dark oil and gas cap well effluents

Component	Dark Oil (Weight Fraction)	Gas Cap (Weight Fraction)
Methane	0.1034	0.4791
Ethane	0.0230	0.0813
Propane	0.0249	0.0745
Butanes	0.0265	0.0547
Pentanes	0.0239	0.0437
Hexanes	0.0355	0.0426
Heptanes plus	0.7628	0.2241
Propane and lighter	0.1513	0.6349
Butanes and heavier	0.8487	0.3651
Cu. Ft. Propane and lighter per 100 lbs. wells effluent	294	1297
Density of Butanes and heavier, lbs. per gallon at 60° F.	7.044	5.951

The above data have been used for establishing equations for this assumed field. The essential equations are shown graphically on Figures 1 and 2.

Figure 1 represents the relationship of the density of the isobutane and heavier with the amount of dark oil in the mixed well effluent for the above assumed field.

Figure 2 shows how the isobutane and heavier content in a mixed well effluent varies with the amount of dark oil in the well effluent.

The equations represented by these figures are of use even if no pressure control operations by means of injected gas are being conducted in this field. In this event, it is possible by their use and the analysis of the well effluent to determine the proportions of dark oil and gas cap fluids being produced, and also the respective percentages of solution gas and gas cap gas as long as the reservoir pressures are in excess of the saturation pressure.

Basic Equation Changed

In the event pressures are maintained by gas injection, the amount of injected gas being produced is of primary concern. Hence, it is well to develop what its effect is upon the well effluent and thus determine the quantity of it being produced. For the demonstration of this method, it has been taken that the resi-

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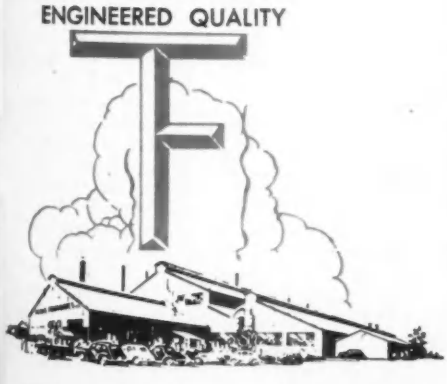

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due gas to be used for injection purposes will contain only a small amount of the butanes, as the demand for these fractions by refineries has led to their high recovery by absorption plants. This being the case, the presence of injected gas will cause a dilution of the isobutane and heavier portion of well effluent. The basic equation covering the analyses of mixtures of dark oil and gas cap fluids is thus changed by the presence of injected gas. The density of isobutane and heavier portion is affected by the small amount of butanes in the injected gas, so this equation must be modified. The weight fraction of dark oil present in the mixed well effluent is approximated from the density of the isobutane and heavier relationship as shown in Figure 1. The resulting value for the dark oil is then used in the equation expressing the amount of injected gas from the well effluent analysis to determine approximately how much injected gas is present. By use of this approximate value in the modified density equation, a better value for the amount of dark oil can be found. By repetitions of these approximations, constant values for the amount of injected gas and dark oil present in the dark oil-gas cap portion of the well effluent mixture can be found. Once these are known, the weight fractions of dark oil, gas cap and injected gas, neglecting enrichment, in the well effluent can be computed. The equation expressing the amount of injected gas by analysis of the well effluent is represented in Figure 3, where the above equation has been corrected for the butanes content of the residue gas used as injected gas for this assumed field.

For more practical purposes, it is desirable to know how much of the wet gas is being produced from each source, or its volume percentage distribution. From the composition of the well effluent, the volumes of propane and lighter from each source and non-enriched injected gas can be calculated and used to distribute the wet gas production. In this case it is necessary to deduct the volume of injected gas from the wet gas production and distribute the balance according to the propane and lighter from the dark oil and gas cap fluids. By this means it is possible, therefore, to determine the cause of the increased gas-oil ratio for a producing well.

An illustration of the use of this method of determining the migration of gas cap fluid and injected gas will be given by the use of the following data of an assumed well shown as well "1" on the figures: This well has been found by analysis of the wet gas and trap fluid and production data to have a well effluent containing 0.6684 weight fraction of isobutane and heavier with a density of 6.850 pounds per gallon, and also to contain 670 cubic feet of propane and lighter per 100 pounds of well effluent. The well is producing with a gas-oil ratio of 3220 cubic feet per barrel and 441.0 pounds of well effluent per barrel of tank oil. From Figure 1, the weight fraction of dark oil for a density of 6.850 pounds per gallon is expected to be 0.702. The expected weight fraction of isobutane and heavier from Figure 2 for this value of dark oil is 0.704. Since this is greater than the 0.6684 found by analysis, injected gas is present. The weight fraction of injected gas for this well effluent is found to be 0.0525 and an equivalent dark oil weight fraction of 0.7033 as shown by well "1" on Figure 3. The well effluent is thus found to have 0.0525 weight fraction of injected gas, 0.6664 weight fraction of dark oil fluid and 0.2811 weight fraction of gas cap fluid. To make a distribution of the wet gas production, it is first necessary to compute the volume of propane and lighter from each of the sources contributing to the production per 100 pounds of well effluent. This is found to be 106 cubic feet of injected gas, 196 cubic feet from the dark oil fluid, and 365 cubic feet from the gas cap fluid, for a total of 667 cubic feet. The distribution of the wet gas produced per barrel of tank oil is found by subtracting the volume of injected gas in the total well effluent, 468 cubic feet from the gas-oil ratio of 3220 cubic feet, and distributing the resulting wet gas according to the propane and lighter from the two remaining sources. The distribution thus developed is as follows:

	Cubic Feet	Volume Percent
Injected Gas	468	14.5
Dark Oil	962	29.9
Gas Cap	1790	55.6
	3220	100.0

Results of this method applied to the well taken for an example shows that the entry of gas cap fluid is the primary cause of the increased gas-oil ratio. Injected gas is shown to be present and should possibly be controlled by remedial work.

The well effluent analysis method can be modified to apply also to a single phase reservoir, being cycled, or a dark oil reservoir being operated under pressure maintenance by injected gas. In this latter case, an enrichment of the injected gas due to contact with the residual oil in the reservoir may occur, which might lead to the belief that a gas cap was originally present in the reservoir.

One of the assumptions made in developing this method is that the enrichment of injected gas will be from the dark oil fluid as a whole. This is not strictly true as the enrichment can only occur from the components volatile at reservoir conditions. This enrichment of the injected gas by the residual dark oil is a continuous one throughout the contacted oil and can best be described as a process in which the vapors from one step of enrichment come into contact with another portion of fresh residual oil, and so forth, until the vapors can become no richer, or enter the well bore. Meanwhile fresh injected gas comes into contact with partly denuded residual oil and so on, until all of the components volatile at reservoir conditions have been vaporized. The enriched injected gas will approximate the composition of the vapors in equilibrium with the residual oil and should have approximately the composition and properties of the gas cap fluid. As the stripping progresses, the enrichment will become progressively less and finally no enrichment will occur.

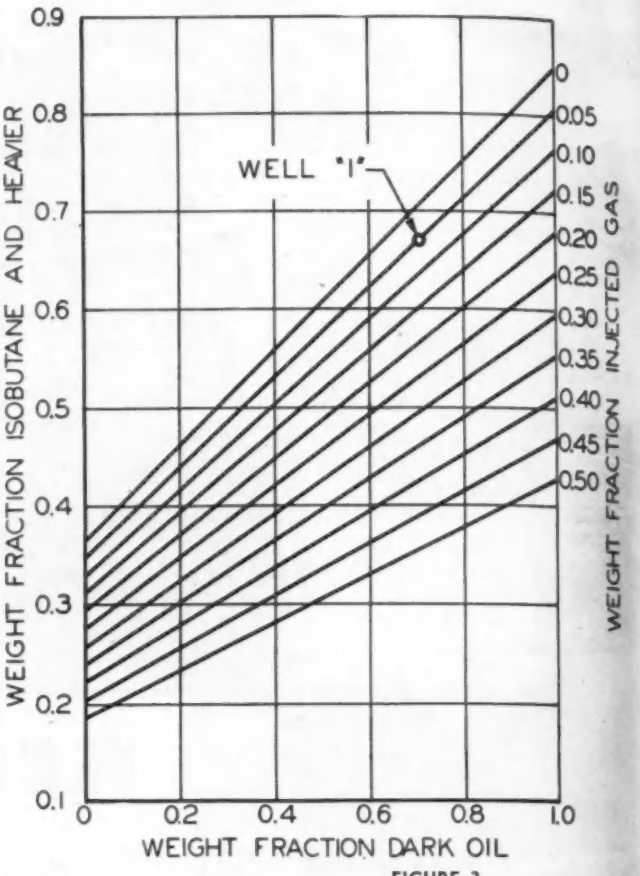

FIGURE 3

Weight fraction of injected gas from weight fractions of dark oil and isobutane and heavier in well effluent.

Thus it is possible to have four types of fluid present in a well effluent—dark oil, gas cap, enriched injected gas, and injected gas. It is not possible to distinguish between gas cap fluid and injected gas which has been completely enriched. The method does show the amount of injected gas that has not been enriched and should be of help in the guiding of pressure control operation and the planning of remedial work.

Periodic surveys by this well effluent analysis method in a producing field under pressure control operation by injected gas will give information as to the migration of gas cap fluid and injected gas. Such a survey requires the fractional analyses of two samples per well, wet gas and trap fluid, the production data, and about three hours calculating time. The cost per well would be from $50 to $60 per survey and will give more information than the use of a tracer gas process. Even if a tracer is used, it is desirable to supplement the tracer method with the well effluent analysis method, as the tracer will only show the amount of any injected gas being produced and not how much of the increased gas-oil ratio may be due to gas cap expansion.

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[1] Oil and Gas Journal—November 19, 1942, page 36.

[2] Prediction of Volumetric and Phase Behavior of Naturally Occurring Hydrocarbons, Dodson and Standing, Drilling and Production Practice, 326 (1941) API, New York (1942.)

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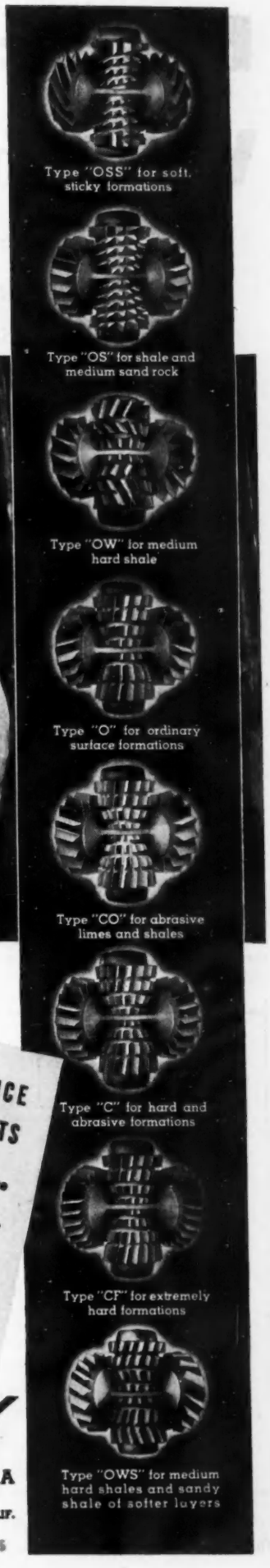

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Electrical Well Logging

The magnitude of the Potentials observed in bore holes is appreciably modified by a large number of factors. Although the exact influence of all these factors is not always visualized as yet, it is nevertheless possible to understand the most important features of the Potential graph.

By HUBERT GUYOD
Development Engineer
Halliburton Oil Well Cementing Company
Duncan, Oklahoma

PART 15

Electrical Potentials in Bore Holes

(Continued)

A FEW potential phenomena occurring between shales and salt water sands have been easily explained in a preceding article by considering the equivalent circuit of the conducting system involved. This circuit is reproduced on Figure 15-1 where B is the battery duplicating the electromotive force V of the electrochemical chain shale—mud—salt water sand. R_1, R_2, and R_3 are the equivalent resistance of the mud column, of the shale, and of the bed under investigation, respectively. The potential V_1, namely, the maximum deflection observed on the potential graph between shale and object bed, was found to be equal to

$$V_1 = \frac{R_1}{R_1 + R_2 + R_3} \times V \qquad (15\text{-}1)$$

This equivalent circuit will be used now to investigate the condition existing when the formations investigated are not clean salt water sands. To avoid confusion, "formation potential" will designate the potential of the mud column near the middle part of the formation.

To conform to common usage, large, or high potential will designate a potential which is much more negative than that of the formation used as reference (shale, usually).

Highly Resistant Beds

Consider a homogeneous bed of extremely high resistivity, for instance, an extremely dense lime several thousand times more resistant than the drilling mud and the associated shales. It is likely that the corresponding electrochemical chain, namely, shale—mud—lime, has a measurable electromotive force, although its value might be different from that considered previously for sands. According to the theory discussed in the preceding article, the

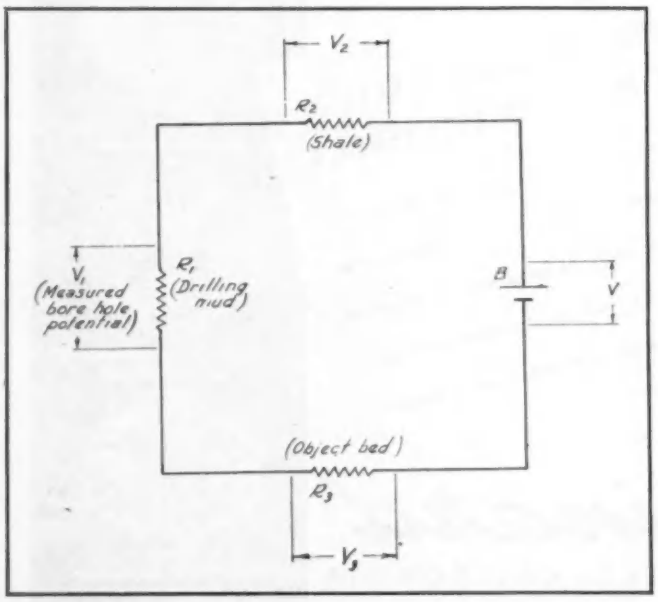

FIGURE 15-1
The equivalent circuit of the conducting system shale-drilling mud-sand.

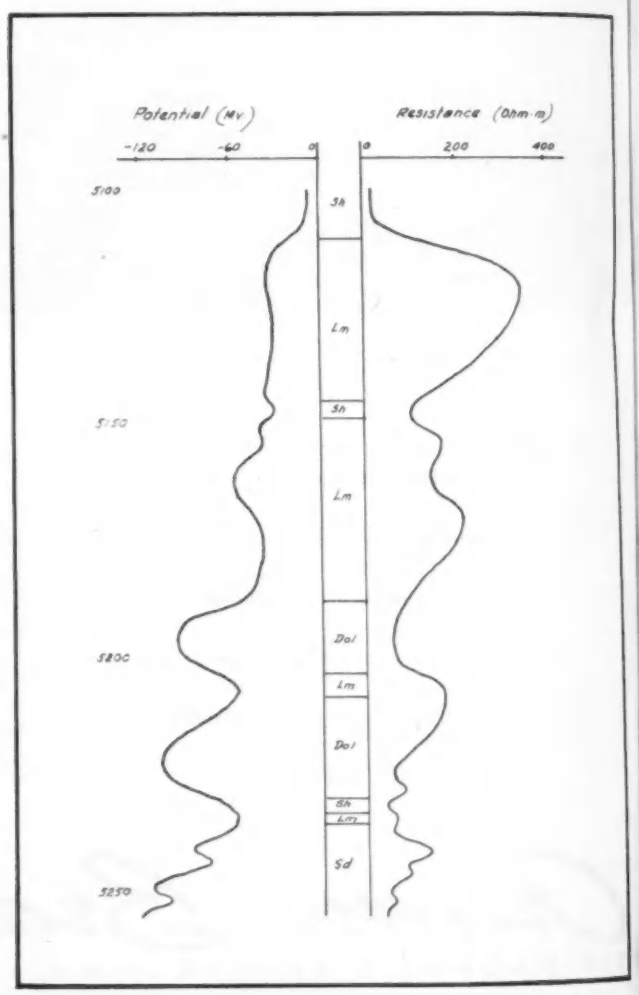

FIGURE 15-2
Parallel between potential and resistance in an Oklahoma well.

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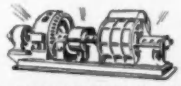

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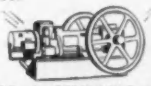

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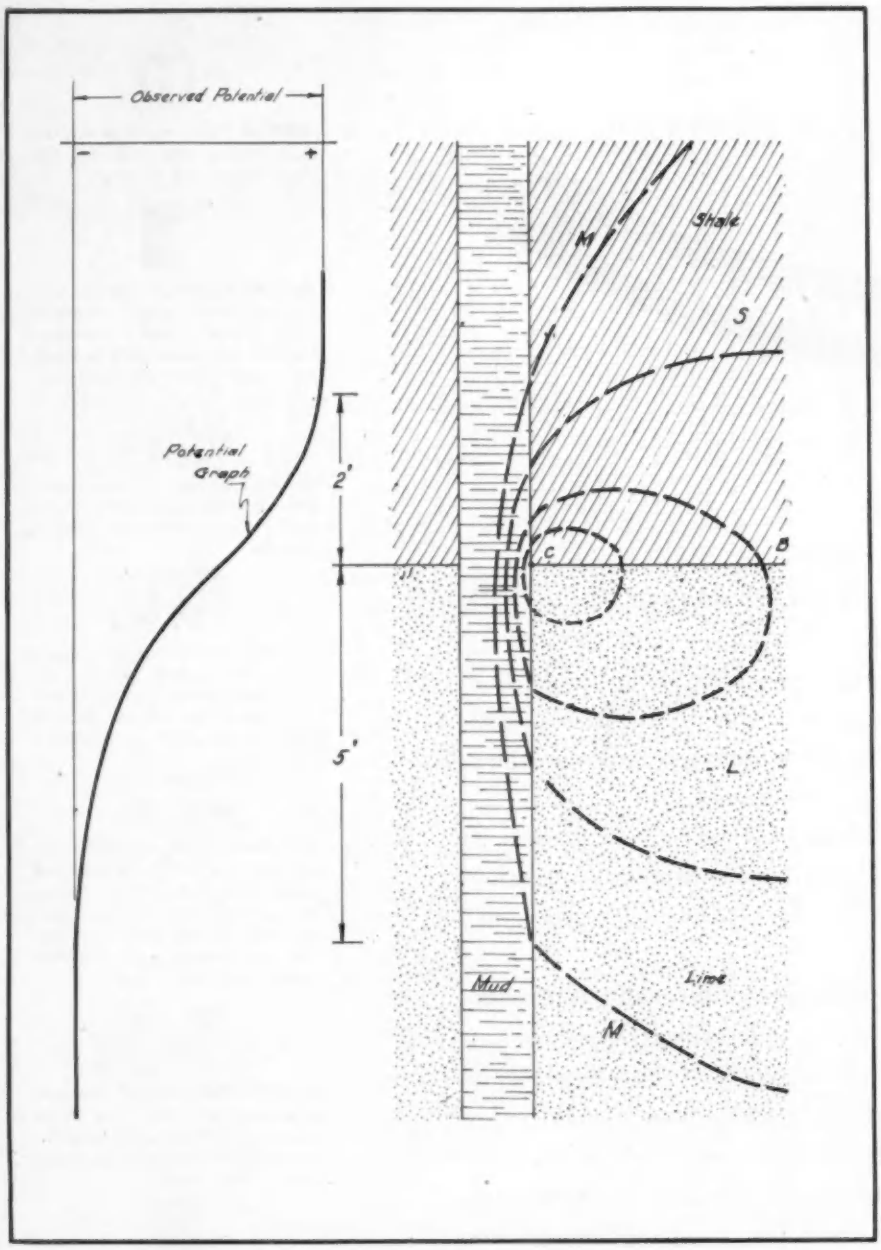

FIGURE 15-3
Current line pattern and potential graph near shale-mud-line boundaries.

potential graph should exhibit a relatively large deflection when the measuring electrode travels from the shale to the lime. It is known, however, that this is usually not true. Extremely resistant formations exhibit approximately the same potential as shales. In order to explain this apparently anomalous result, it is helpful to refer to the equivalent circuit of Figure 15-1. For extremely resistant beds, R_3 is considerably greater than either R_1 and R_2. The fraction $\frac{R_1}{R_1+R_2+R_3}$ and, consequently, V_1, is then extremely small. No large potential changes can therefore be observed in bore holes between shales and extremely resistant formations. In the extreme case of a bed almost infinitely resistant (anhydrite, for instance) no potential change is observed.

If the object bed is less resistant than it was just assumed, but still considerably more resistant than the shales and the drilling mud, then the fraction $\frac{R_1}{R_1+R_2+R_3}$ is no longer almost equal to zero. It has a relatively small value, perhaps one-fourth. According to equation (15-1), the potential V_1 opposite this bed will be equal to $\frac{V}{4}$, namely, it will equal approximately one-fourth the potential which a conductive sand would have, assuming this sand to be similar to the lime, electrochemically. To summarize, it can be seen that the higher the resistivity of the bed, the smaller the potential observed, all other factors remaining the same. This relation is illustrated in Figure 15-2 representing the Viola and Wilcox section of an Oklahoma well. The resistance log is a two-electrode curve obtained with a two-foot spacing. The correlation between Potential and Resistance is striking.

Determining Permeability

The foregoing remark explains why the magnitude of the potential observed in high resistance formations can frequently be used for the determination of presence or absence of permeability. Tight formations are permeable neither to fluids nor to electricity because they offer no conductive channels. Their resistivity is therefore extremely high, and their potential is approximately the same as that of the associated shales. On the other hand, more permeable formations offer many conductive channels to the flow of an electric current; their resistivity cannot have extremely high values, and their potential is higher than that of shales, the more permeable formations having the highest potentials, all other factors remaining the same. Although the potential graph is very helpful in many cases for locating very dense formations, it should not be forgotten that the same information is given also by the resistance curves.

Near a shale boundary, the potential graph is usually more rounded in resistant formations than in conductive ones. This feature can be explained by remembering that resistant beds repulse current lines and that this repulsion is particularly important in the case of very resistant beds. Referring to Figure 15-3, L is a thick resistant formation, a porous lime for example, situated below a shale bed S. Instead of flowing according to the pattern of Figure 14-6 (see Part 14 of the series, THE OIL WEEKLY, Nov. 20, 1944), the current is repulsed by bed L in the bore hole section situated below boundary B. This effect straightens the current lines situated in the bore hole below point C, which lengthens the path the current follows in the mud column below the boundary B. Therefore, there is still an appreciable amount of current flowing in the bore hole several feet below the boundary, which means a potential drop will be observed over a relatively long section in this zone.

This will also decrease the potential gradient opposite bed L, which gives the potential graph a more rounded shape than if a low resistance formation were logged. Above the boundary B, the flow of current is not appreciably distorted, and the resulting graph is sharper than that opposite bed L, but less sharp, however, than if only very conductive beds were involved.

The preceding condition is illustrated on Figure 15-4 which represents the electric log obtained on the Hunton lime in an Oklahoma well.

In thick lime sections (West Texas, for instance) only minor potential changes are usually observed, regardless of the changes in porosity. These small fluctuations have not been explained as yet, but it is probable that they are due to mineralogical changes.

Determining Boundaries

Referring to Figures 14-6 and 14-10 (Part 14), it has been seen that the steepest part of the potential graph is situated exactly at the shale-sand boundary. The same result is obtained in resistant formations (Figure 15-3). If the formation logged is a sand of relatively low resistivity, this point is nearly half way between the potential in shale and that in the sand. This does not hold

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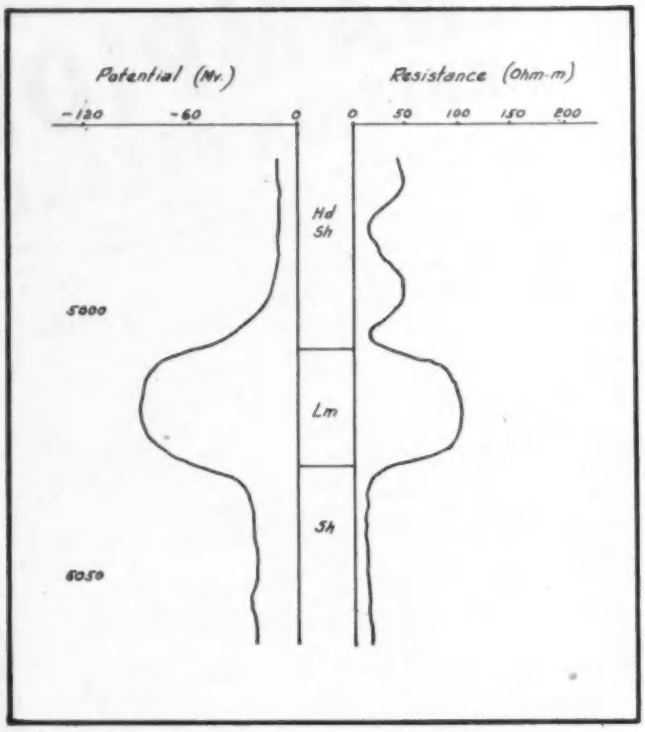

FIGURE 15-4

Typical electric log of Hunton lime (Oklahoma).

true, however, in very resistant formations.

The most reliable rule to determine boundaries from a potential graph is therefore to pick the points where the curve is steepest.

Effect of Mud Salinity

If one of the constituents of the chemical chain shale—mud—salt water is altered, either in nature or in concentration, the magnitude of the electromotive force generated in the ground will change. Experience and theory show that this voltage will be greatly reduced when the mud has about the same nature and concentration as the water contained in the sand. The decrease, however, does not follow a linear law, but a much slower one. In fact, it has been observed that relatively large changes in mud resistivity (i.e., changes in mud salinity) usually result in only negligible changes in the potential values so long as the salt concentration is not too great. In practice, no great difference is observed in the magnitude of the potential when the mud resistivity varies from 1 to 6 ohm-m, as evidenced by a considerable number of electric logs. Usually, the potential is appreciably reduced only when the mud becomes very salty. Assuming that the mud and the water contained in the sand have the same composition and differ only in concentration, the potential should disappear completely when the concentration of the two fluids is approximately the same. The exact vanishing point is determined however by a relatively large number of factors, the exact influence of which is unknown at present. These factors are dependent upon the nature of the solid phase in suspension in the mud and the chemical composition of the salts dissolved in the waters involved in the electrochemical chain. From a survey made in a considerable number of wells, it appears that the most critical factor is the chloride content of the waters forming the chain.

Figure 15-5 is part of an electric log obtained in a water well of the city of Houston. The following table gives the composition (parts per million) of the water of sands A and B, and of the drilling fluid. It can be seen that the increase in chloride content from bed A to bed B results in a large increase in negative potential.

	Chlorides	Bicarbonates	Sulphates
Sand A.....	87	380	4
Sand B.....	340	389	13
Mud.....	45	....	..

Analysis made by the City of Houston Utilities Department.

It happens sometimes that the salinity of the mud of a well to be logged is close to the critical value. If an acceptable potential curve is desired in this well, it is necessary to replace the mud by one being much more resistant, if possible. If this is not feasible, a more conductive mud can be used, but it should be remembered that this type of mud will usually alter the resistance curves also and make more difficult the determination of true resistivities.

Logging in Silicate Mud

A reversal of the polarity of the electromotive force of the electrochemical chain shale—water sand—drilling mud can take place when the chemical nature of one of the elements is changed, for instance when the usual drilling fluid is replaced by an entirely different type of mud. This reversal can be explained by referring to Figure 15-6, which represents two electrochemical cells having identical respective poles, but whose electrolyte differ. In each cell one of the poles is made of copper and the other of lead. If the electrolyte is sulphuric acid the copper pole is negative, whereas it is positive when the electrolyte is potassium monosulphide. The electromotive force of these two cells is also different. In other words, the polarity of the electromotive force of a cell is a function of the electrolytes it contains.

A similar condition is obtained when the usual drilling mud of a well is replaced by silicate mud; namely, the polarity of the potentials is reversed. This is illustrated in Figure 15-7 showing two potential graphs obtained in a Bayou Sale, Louisiana, well. The curve to the left, which was made in normal mud, gives the usual deflections in sands (more negative than shales). The curve to the right was obtained after the fresh mud was replaced by silicate mud. The polarity of the potential curve is reversed and the magnitude of the peaks is reduced to approximately one-third their normal value. It can be observed that notwithstanding the low resistivity of the silicate mud (approximately 0.1 ohm-m at 60° F.), the potential deflections are very sharp.

Thus far, when logging wells containing silicate mud, it has always been observed that the sands are more positive than the shales. On the other hand, it is known that the sands are negative when ordinary or slightly salty mud is used. By varying the composition of the silicate mud it is evident that it would

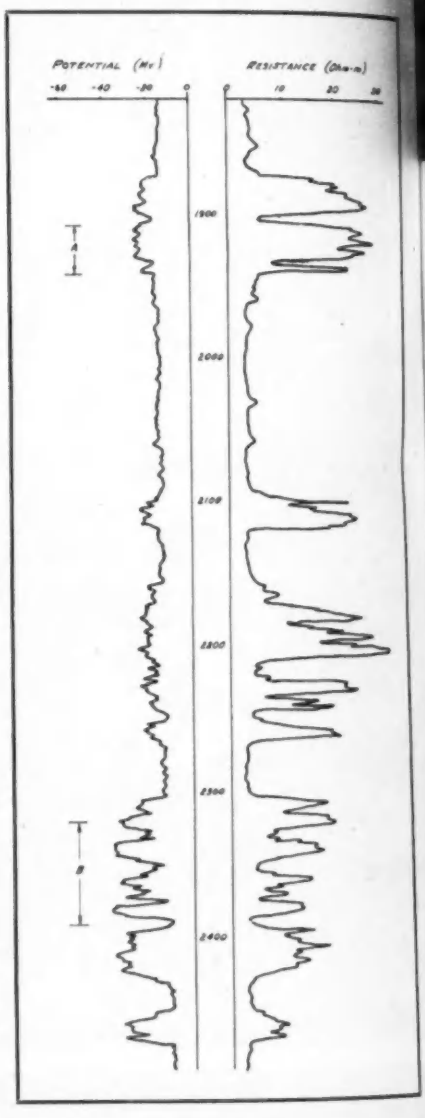

FIGURE 15-5

Electric log of a water well (courtesy city of Houston Utilities Department).

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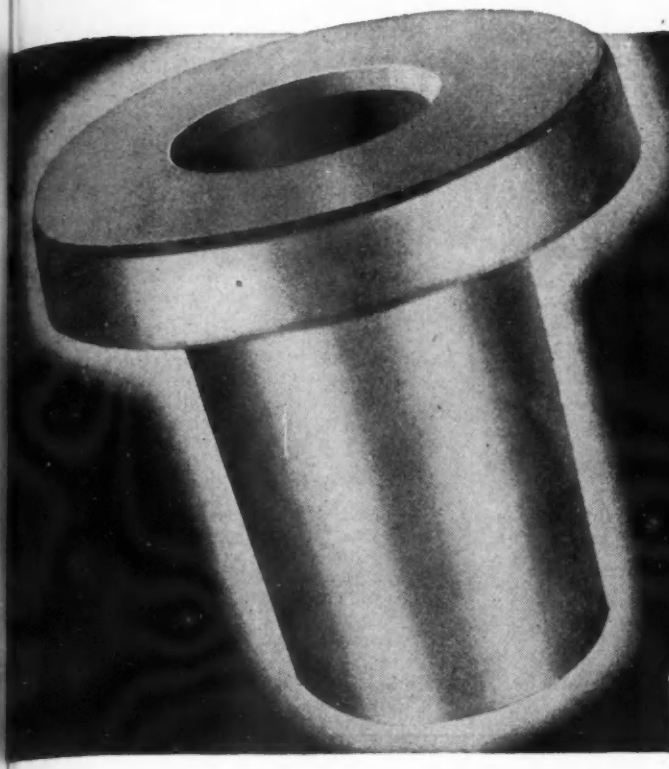

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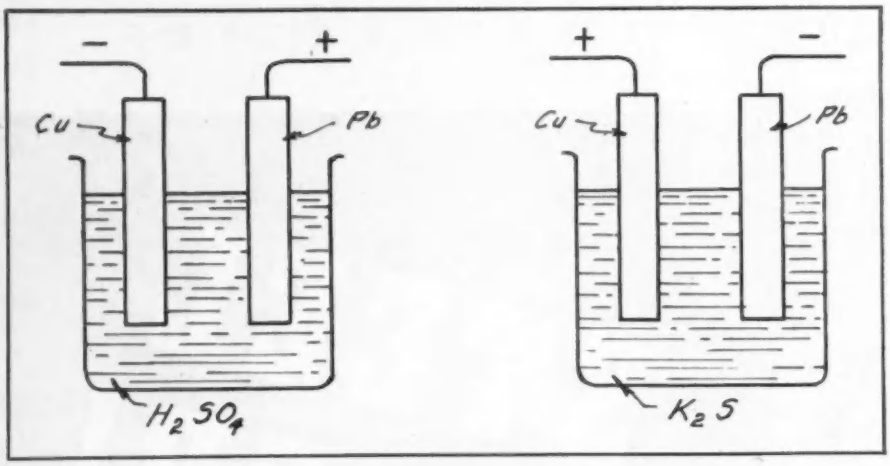

FIGURE 15-6
Galvanic cells having like poles but opposite polarity.

be possible to obtain a mud which would give practically no changes in potential when the electrode would travel from shales to sands. As far as is known, muds having this critical composition have, fortunately, not been used as yet.

Fresh Water Sands

Fresh water sands usually are found at shallow depths. The composition of the mud which fills a bore hole at the time these shallow formations are logged is a function of the total depth of the hole. If the well is drilled for the purpose of obtaining drinkable water, then in general the drilling fluid is essentially made of the same water as that contained in the sands to be logged. Under this condition, it is found that the sands are usually slightly more negative than the associated clay.

If the well is carried to a large depth before it is logged, then the mud contains in solution a relatively larger amount of sodium chloride originating from the drilling of salt water sands. It is found that, in such cases, the potential of the fresh water sands is frequently more positive than that of the associated clay.

There are so many factors controlling the electrochemical potentials that it is difficult to determine the exact conditions under which the reversal of the potential in sands will be obtained. The best available approximation is to assume that this point is reached when the resistivity of the mud is approximately equal to the resistivity of the water contained in the sand opposite which the logging electrode is located.[1]

Figure 15-8 represents the electric log of two Oklahoma wells of the same field. The log to the left was made in fresh mud (resistivity: 1.7 ohm-m), whereas the log to the right was run in very salty mud (resistivity: 0.05 ohm-m). The reversal of the potential in salty mud is clearly illustrated. Note also the low resistance of the sands of the well to the right (mud invasion).

Oil Sands

The potential observed in oil or gas sands is approximately the same as that obtained in water sands, all other factors remaining the same, Occasionally, however, this potential seems to be slightly less than normal. This can be attributed to one, or both, of the following causes:

1. When the object sand has a relatively high resistivity, it is natural (as explained when discussing very resistant beds) that the observed potential should be decreased.

2. Oil sand and gas sands contain a phase, the oil or the gas, which is not present in water sands. The presence of this substance might modify slightly the electromotive force of the electrochemical chain and therefore change the observed potential.

Shaly Sands

It has been explained in a preceding article that large potential differences can be observed in a bore hole between shales and clean sands. If a sand contains a large amount of shale, the electrochemical chain, shale—fresh water—salt water, is replaced by chain which is basically equivalent to the chain shale—fresh water—shale. No appreciable electromotive force is generated by this chain. The sand will therefore exhibit approximately the same potential as that of shales.

Sands containing only a moderate amount of shales should have a fair potential. In general, the larger the shale content, the smaller the potential of the sand. This explains why shaly or silty sands exhibit usually an extremely small potential, even when their porosity and permeability are high.

Effect of Hole Size

It has been explained that when the resistivity of the formations under investigation is relatively small (salt water sands), the potential difference observed between sands and shales is approximately equal to the voltage V of the hypothetical battery B of the equivalent electric circuit. This result holds true regardless of the size of the hole pro-

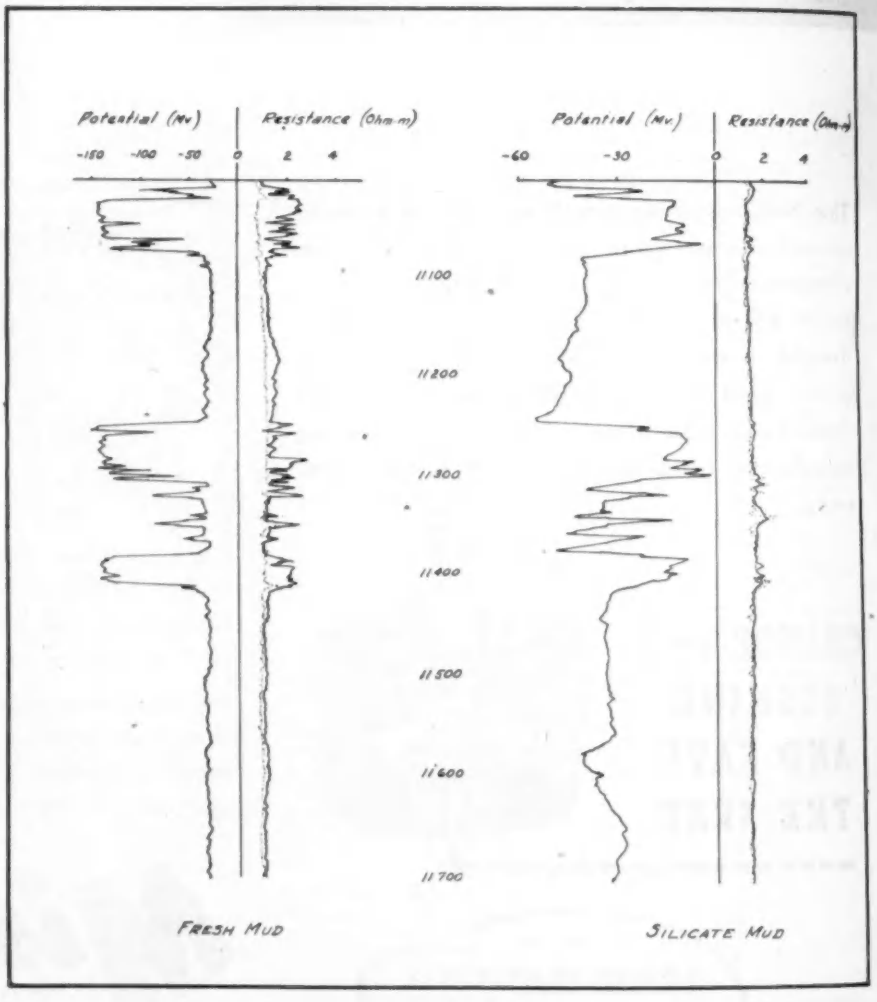

FIGURE 15-7
Effect of silicate mud on bore hole potentials, Bayou Sale, Louisiana. (Courtesy Humble Oil & Refining Company.)

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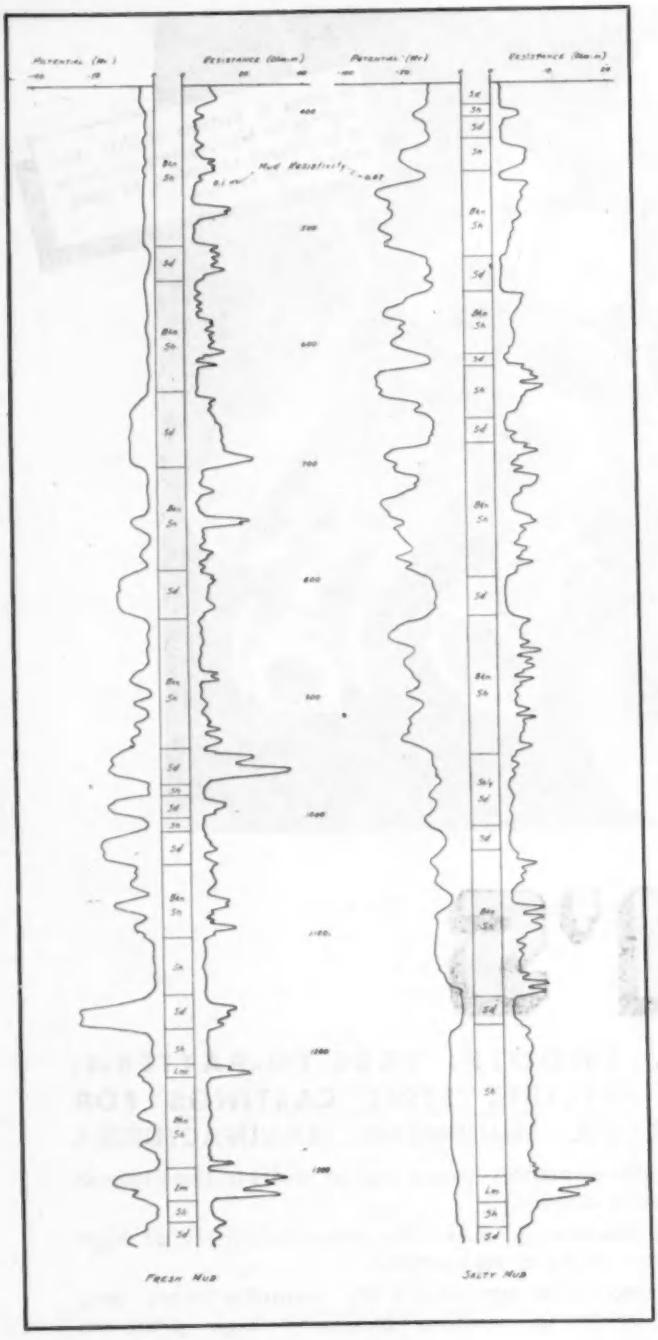


FIGURE 15-8
Effect of mud salinity on potential of fresh water sands, St. Louis area, Oklahoma. (Wells are approximately 2000 feet apart.)

shifts. These shifts are very consistent in a given area and are often used as reliable correlation markers. Figure 15-4 is an example of such potential shift found in Oklahoma in the shales associated with the Hunton lime. These potential variations must be caused by changes occurring in one or several factors controlling the magnitude of the potential, probably the nature of the shale itself. Indeed, this can be seen on Figure 15-4, where the resistance curve shows that the various shale sections are widely different.

A similar remark can be made regarding the drift of the potential graph observed frequently in the shales associated with fresh water sands. This drift is probably caused by changes in the salinity of the water contained in the shale, which, in turn, produce changes in the electromotive force generated in the ground.

The deeper sections of wells also exhibit potential drifts, although their magnitude is smaller than that associated with fresh water bearing formations. A drift is usually observed in the shale base line and one in what can be called the sand base line. The drift in shales averages about + 3 millivolts for an increase in depth of 1000 feet. The drift in sands averages — 4 millivolts per 1000 feet. Compared with the average value in shales, the average potential in sands will therefore exhibit a drift of approximately — 7 millivolts per 1000 feet, on the average.

The exact cause of this increase is unknown. It is so regular that it is logical to assume that one or several of the following factors might be responsible for it: 1) Terrestrial currents, 2) temperature, 3) salinity gradient, or 4) pressure.

Terrestrial Currents

Several investigators have reported the existence of a steady vertical electric current in the earth's crust, different from the telluric currents mentioned previously. The density of this current is extremely small, and it is estimated to be from 1 to 100 amperes per square kilometer according to the investigator,[3] the deeper rocks being more positive than the shallow ones. A value of 10 amperes per square kilometer will be assumed in the following discussion. In a medium whose resistivity is 1 ohm-m, this current would give rise to potential drops of 0.01 millivolt per meter, or 3 millivolts per 1000 feet. This terres-

vided it varies within reasonable limits. Changes in bore size therefore bring no appreciable change in the potentials observed when the formations being logged are conductive. In the Gulf Coast, for example, no variations are usually observed in the magnitude of the potential when the size of the hole varies from 7 to 10 inches, all other factors remaining the same. In the more resistant formations of Mid-Continent, the preceding rule does not apply as well, and an increase in hole size results in a slight decrease in potential. The reason therefore is easy to understand from an inspection of equation (15-1).

Potential Base Line

The potential curve obtained in shales is usually approximately straight over long distances. For this reason, it is often used as reference and called the "potential base line." Occasionally, this base line exhibits, however, appreciable

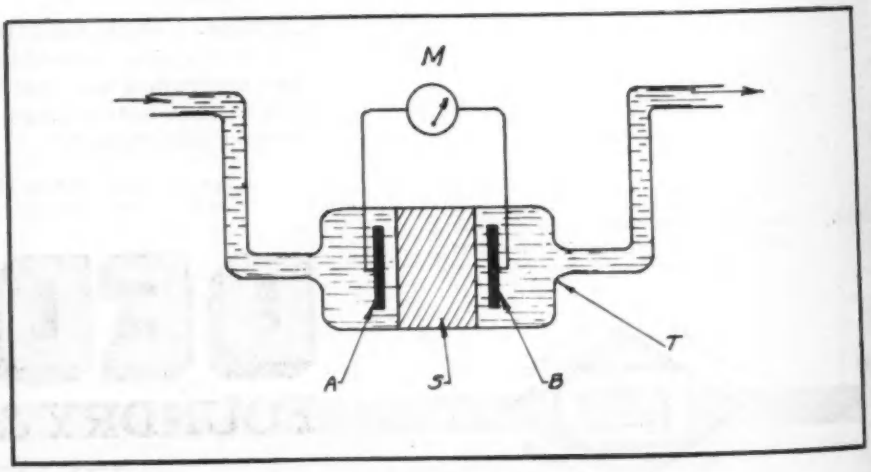
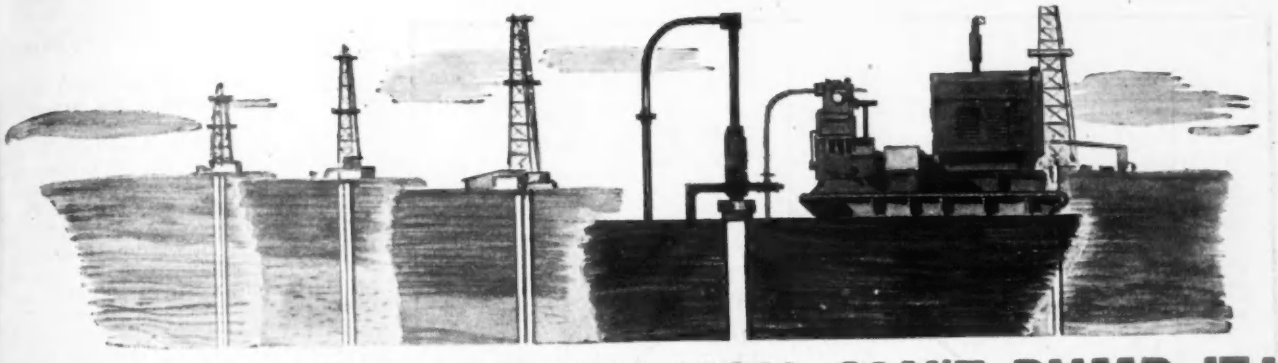


FIGURE 15-9
Apparatus for observing streaming potentials.



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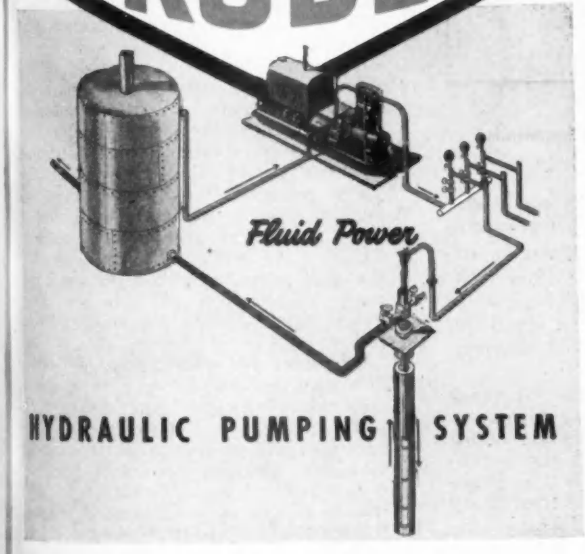

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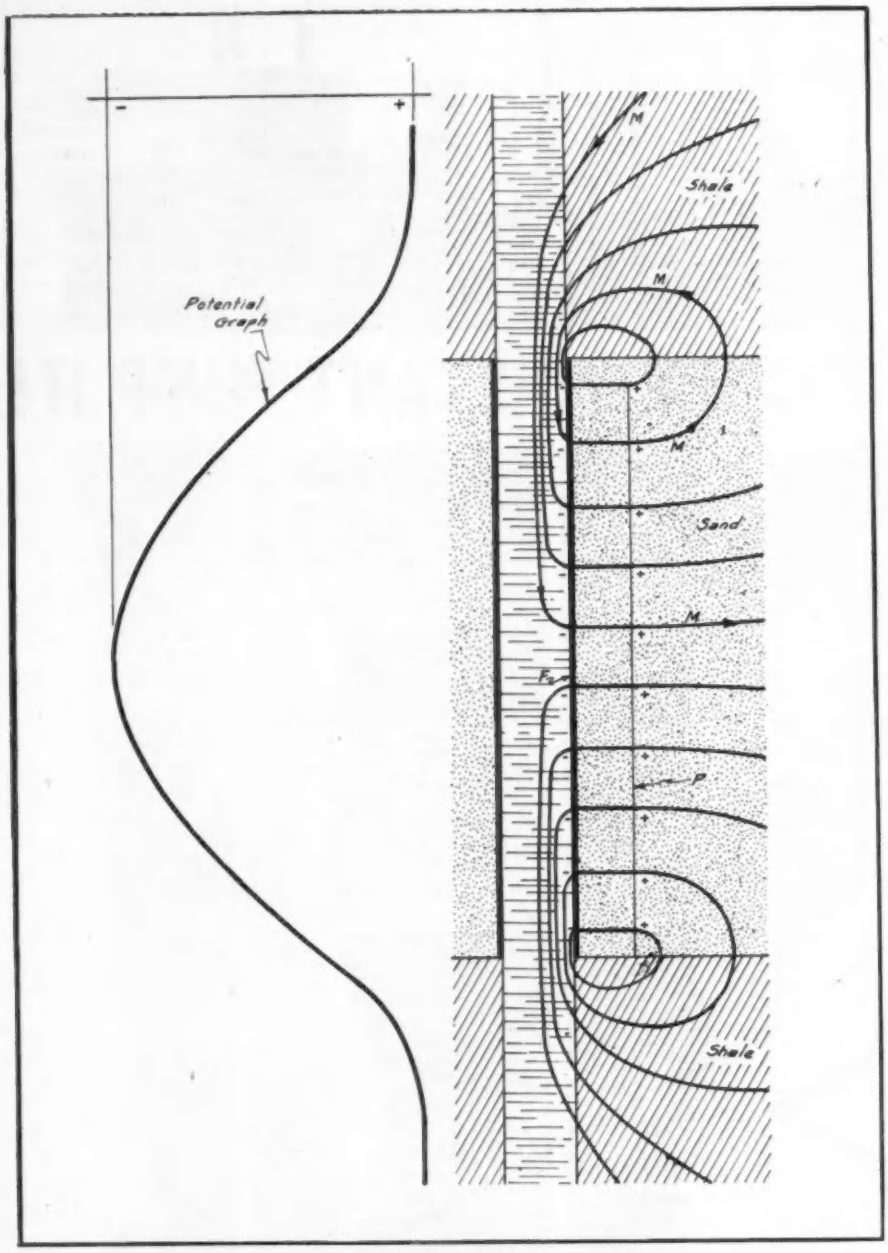

FIGURE 15-10

Current pattern and potential graph produced in a bore hole by streaming potentials.

trial current could therefore explain at least part of the potential drift. However, due to the uncertainty of the intensity of this current, it is not possible to ascertain the exact influence of this factor.

Effect of Temperature

The electromotive force of galvanic cells changes with temperature. The changes are quite variable, depending upon the nature of the substances forming the electrochemical chain. They can be either positive or negative. For certain cells of low electromotive force (200 millivolts), the increase can be as high as one tenth of one millivolt per degree Fahrenheit or about 2 millivolts per 1000 feet. This, however, could explain only part of the increase observed in bore holes.

Salinity Gradient

A salinity gradient seems to exist for the waters of sedimentary formations. The deeper formations are as a rule more saline, although many exceptions are known to exist. As previously explained, these changes must modify the electrochemical potential, although within small limits, resulting in a small but steady increase in the potential observed between shales and sands.

Because of the temperature increase with depth, the resistivity of formation water decreases steadily. This factor might play a certain role in the potential drifts observed, although it is probably small because the mud resistivity decreases simultaneously.

Effect of Pressure

Theoretically, pressure can modify the potentials existing in bore holes in at least two different ways.

1. The electromotive force of the galvanic chain is changed.

2. The percolation of water through formations might give rise to streaming potentials.

The electromotive force of a galvanic cell is increased when the pressure increases, the increase varying linearly with the pressure, in general. The magnitude of the change is a function of the chemical reactions taking place in the cell. So little is known of the reaction which generates bore hole potentials that it is impossible to estimate at present the effect of depth (pressure) on the potential curve. All that can be said is that an increase of several millivolts per 1000 feet is not ruled out. Pressure alone could therefore explain the potential drift observed in wells.

Streaming Potential

Because no better explanation was available, streaming potentials have been erroneously assumed to be one of the main causes of the potentials observed in bore holes. Before attempting to estimate the relative importance of these potentials in electrical logging, the mechanism of their generation will be briefly discussed. To simplify the discussion, it will be assumed that the system under investigation comprises only two phases, one being a non-conductive porous solid and the other a liquid electrolyte.

If an electrolyte is forced by pressure through a porous medium, an electromotive force is generated which is called "streaming potential." This phenomenon is only a particular case of mechanical energy being transformed into electrical energy, although the power involved is extremely small and very poorly utilized. As drilling mud percolates to a small extent through the filter cake of sands, it is probable that streaming potentials are produced somewhere in the ground.

A phenomenon, the reverse of that just described, has been observed in laboratories. This phenomenon, which is called "electro-osmosis," is the displacement, produced by an applied voltage, of a liquid with reference to a solid. Electro-osmosis involves the transformation of electrical energy into mechanical energy. It is obvious that, unless the ground is energized by an electric current, electro-osmotic effects cannot exist in bore holes.

The name "electro-osmosis" should obviously not be used to designate the potentials generated by the filtration of a liquid through a porous medium or through capillary tubes. These potentials should be called streaming potentials, or flow potentials, or filtration potentials, the first expression being preferable to the others because it is used in textbooks. A similar remark applies to the expressions "electro-filtration," and "electro-capillarity," which are often misused to designate streaming potentials.

Expression for Streaming Potential. When two substances are in contact, or are rubbed against each other, they acquire charges of opposite polarity. When a liquid moves against a solid, the electric charges produced by friction are carried away; that is to say, an electric current is generated. Figure 15-9 represents diagrammatically a laboratory apparatus for producing and investigating streaming potentials. S is a porous plug set in a tube T made of a non-conductive material. Two non-polarizing electrodes A and B are placed near the extremities of the plug and are connected to a voltmeter M. When a steady flow of water is forced through S, a potential difference E exists between

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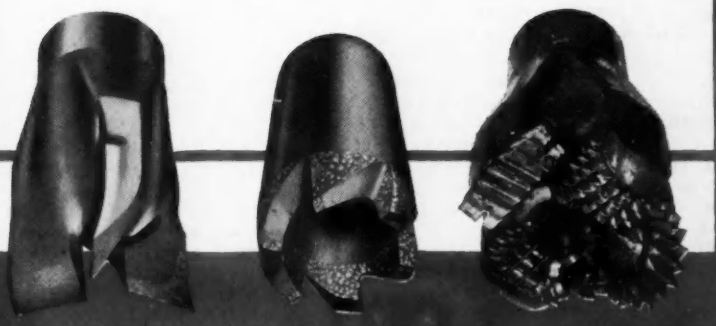

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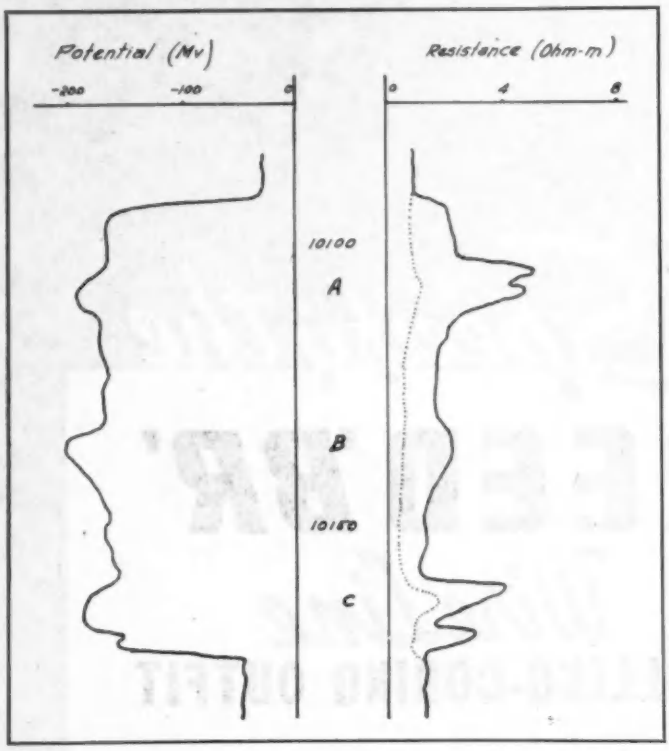

FIGURE 15-11
Increase in potential associated with mud invasion.

the electrodes. It is found that E can be expressed as follows:

$$E = K\frac{PD\rho}{\eta} \qquad (15\text{-}2)$$

where P is the pressure difference existing between the faces af the plug
D is the dielectric constaht of the water
ρ its resistivity
η its viscosity
K is a factor which varies according to the nature of the solid material S and the liquid used.

Equation (15-2) is probably valid for capillary tubes and for permeable media, provided the correct value is used for K. In the ground, the conditions are different from those illustrated by Figure 15.9. A natural sand is usually comprised between conductive materials (shale). This creates a lateral conduction which collapses, if not suppresses, the potential difference existing between the two points where the pressure is applied. In the ground, the effective resulting potential difference must therefore be only a small fraction of the factor E of equation (15-2).

Magnitude of Streaming Potentials in Bore Holes. In bore holes, the factors D and η of equation (15-2) decrease approximately at the same rate in terms of temperature, and the influence of their variations on E can therefore be disregarded.

E is proportionally to ρ, the resistivity of the mud. In a hole whose mud has a resistivity of 5 ohm-m, the streaming potential should therefore be five times larger than in a well whose mud has a resistivity of 1 ohm-m, all other factors remaining the same. Experience based on a considerable number of logs shows that, as long as the resistivity of the mud is greater than 1 ohm-m, the potential varies extremely slowly with the mud resistivity. It is obvious, then, that only a very small part of the potentials measured in wells, if any, could be attributed to streaming potentials.

There are several other reasons which make the existence of streaming potentials in bore holes very problematic. A few of them are examined below.

1. Referring to Figure 15-10, assume that the percolation of mud through a sand generates a potential difference between the face F of the sand and other sections P of the bed. Whether P is the internal face of the filter cake or a surface very far from the hole is immaterial for the present discussion. According to the theory of streaming potentials, surface F acquires a uniform potential V_1, surface P has a potential V_2 different from V_1, and a current flows from P to F outside of the sand. The values V_1 and V_2 mentioned are assumed to be corrected for the loss of voltage due to the conduction of the shale beds between which the sand is situated. The current lines from P to F are represented by the curves MM shown in Figure 15-10. The resulting pattern in the bore hole is different from that given by electrochemical potentials. If only streaming potentials were assumed to exist, the potential graph obtained by moving a conventional logging electrode in the bore hole would be as shown by the curve drawn to the left of the figure. This curve is rounded in the whole section of the mud column opposite the sand because there is a steady current flow in this section, regardless of the sand thickness and resistivity. In practice, such character is never observed on the potential graph of thick sands (more than 10 feet). Therefore, streaming potentials must be absolutely negligible or non-existant for these sands. It is obvious that the same remark can be extended to all permeable formations regardless of their nature and thickness.

2. Equation (15-2) shows that streaming potentials are proportional to the pressure drop P, namely to the differential pressure between the weight of the mud column and the internal pressure of the sand. This pressure difference is usually small, of the order of 100 pounds per thousand feet of hole, but it varies widely between sands which should result in large potential variations between the sands of a given hole. This has not been observed.

If the weight of the mud in a well is increased 20 percent, the factor P will approximately double. This should also double the value of streaming potential. No such large potential increases are observed when the weight of the mud is increased.

3. Other arguments against the existence of appreciable streaming potentials in bore hole have been advanced during past years by a few investigators. These will not be repeated here, and the reader who is further interested can refer to the literature.[3]

High Pressures. Suppose a potential measuring electrode is held stationary in a bore hole while the pressure exerted from the surface on the mud column is increased. It is observed that the potential usually becomes more negative, and that the potential changes ΔV are proportional to the pressure increases ΔP. At any given point of the bore hole the ratio $R = \frac{\Delta V}{\Delta P}$ is found to be constant, at least, within the range of the pressure increments used (up to 2000 pounds per square inch). On the other hand, R varies from point to point in the bore hole, the larger values being usually obtained in sands. R is of the order of 5 millivolts per 100 pounds per square inch in sands, and approximately half as much in shales.

If the factor R is plotted in terms of depth, the resulting curve is usually strikingly similar to the potential graph obtained when no extra pressure is applied.[4] This immediately suggests that the potential increases ΔV are not a new potential generated by the extra pressure, but that they are merely the conventional bore hole potentials somewhat increased by the pressure. This result is in accordance with the remark made previously regarding the increase in the electromotive force of galvanic cells caused by pressure.

These potential increments ΔV are ascribed by a few experimenters to streaming potentials.[4] Although there is not enough data at hand now to understand definitely this phenomenon, it does not seem that streaming potentials can explain the results obtained. In fact, as pointed out before, if streaming potentials were the predominant factor, the graph obtained on a sand by plotting ΔV in terms of depth (for a given pressure increment ΔP) would give a curve similar to that shown to the left side of Figure 15-10, namely, it would exhibit a maximum (of negative value) near the center of the bed. This condition has not been observed.

Zero Potential

Absolute potential values have no meaning. When the magnitude of a potential is expressed as a number, a reference point whose potential is assumed to be zero has to be selected. Which point is used as reference is usually immaterial, and the choice is either arbitrary or a matter of convenience.

In well logging, the potential value obtained in shale sections is generally taken as the reference point. Theoretically, this is not always a reliable procedure because the potential in shales is not uniform. Formations of extremely

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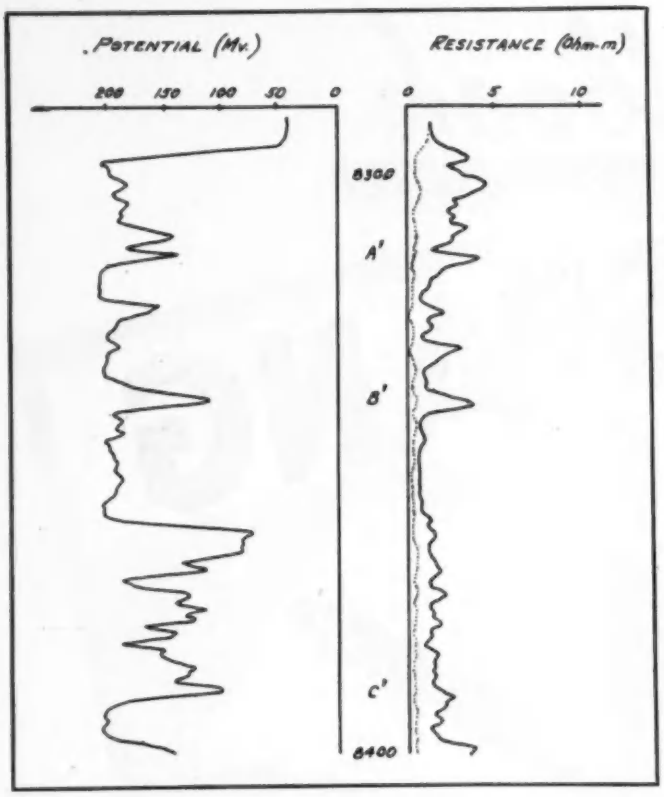

FIGURE 15-12
Decrease in potential associated with mud invasion. (Courtesy Fohs Oil Company.)

high resistivity cannot be used because their potential is linked to the potential observed in shales. The problem of selecting a significant potential reference point is probably insolvable, In practice, this is indeed of little importance, and the old practice of using the most positive value obtained in shales as the point of the log having zero potential is probably as good as any other which might be suggested.

Present Theory Incomplete

Almost every new theory is marred by embarrassing phenomena which do not fit at once into an otherwise satisfactory picture. The electrochemical theory postulated to explain bore hole potentials is no exception. To illustrate this remark, consider, for example, a thick and homogeneous salt water sand situated between two thick shale bodies. It has been explained that the region near each boundary is the seat of an electrochemical phenomena which produces a localized potential drop in the bore hole. In the center section of the sand, the potential should be substantially uniform if the sand is homogeneous, and if the degree of mud invasion is the same at any depth. In practice, such lithological uniformity does not usually exist, as evidenced by most electric logs. Figure 15-11, for instance, represents the electric log which was obtained in a thick salt water sand of a Gulf Coast well.

The resistance curves show that the sections marked A, B and C are more invaded by the mud than the remainder of the sand. In these three sections, the potential is highest. This result could be explained by assuming that sections A, B and C contain much less shale than the other sections of the sand. This is not an illogical assumption because it is known that most Gulf Coast sands contain a variable amount of shale, at lease 5 percent and sometimes as much as 20 percent. According to the foregoing assumption, sections A, B and C are probably more permeable than the rest of the sand; therefore, they should be more invaded by the mud, which explains the character of the resistance curves. The increase in potential in these three sections is also easily explained by the remark made previously regarding shaly sands. Whether the assumption made is correct or not is impossible to ascertain. For the sake of the present discussion, it will be assumed that it is correct.

Referring now to Figure 15-12, the electric log shown represents a salt water sand found in another Gulf Coast field. Here, the sand exhibits sections A', B' and C' which are definitely more invaded than the rest of the sand, as evidenced by the resistance curves. In these sections, the potential is however less than in the main sand body, which is just the opposite of what was found on Figure 15-11. It is obvious that the assumption postulated previously to explain the potential graph of the first well cannot be made in the case of the second well. The only safe statement which can be made regarding the log of Figure 15-12 (and probably also the log of Figure 15-11), is that the potential changes are caused by physical changes within the sand.

The two preceding sample logs are typical of the electrical changes occurring in the ground. They well illustrate the complexity of the factors controlling bore hole potentials. They also show that, while the main cause of these potentials is understood, there are still a number of facts which have not yet been explained. By taking into consideration the presence of the filter cake, the occurrence of lime streaks, the changes in water salinity within the invaded or the non-invaded sections of these sands, the variable amount of shale in the sands, etc., it would be possible, indeed, to give a plausible detailed interpretation of any potential graph. It is doubtful, however, that such interpretations would be entirely correct. More data and research are necessary before the potential graph can be fully interpreted.

Correction

In part 1 of this series (THE OIL WEEKLY, August 7, 1944) it was stated that potential measurements made in a hole filled with drilling mud generally give the algebraic sum of the natural and of the secondary potentials. Investigations made since the publication of this article have shown that the foregoing statement is probably incorrect. When a bore hole is filled with water or mud, it is likely that only the secondary potentials, i.e., the electrochemical potentials are measured. Therefore, it is probably not possible to distinguish one kind of potential from the other when making measurements in a well filled with drilling mud.

Conclusion

The potentials observed in bore holes seem to be caused mainly, if not entirely, by electrochemical reactions taking place between certain formations and the mud column. The magnitude of these potentials is, however, controlled by a complex combination of factors which are tentatively listed below by order of decreasing importance:

Amount of shale
Salinity of mud and of formation water
Bed resistivity
Nature of the shale associated with the object bed
Presence of certain chemicals in mud
Degree of mud invasion
Hydrostatic head
Bed thickness
Nature and distribution of filter cake

The influence of most of the latter factors is not understood at present, and a complete detailed interpretation of the potential graph is often difficult to obtain. However, when the influence of the first factors is fully taken into consideration, the potential graph gives considerably more information than ordinarily suspected.

Negative potentials are not caused by porosity or permeability, but are often associated with these two factors.

A more systematic analysis of potential curves in terms of all pertinent data is suggested with a view to improving the usefulness of this curve.

ACKNOWLEDGEMENTS

The writer wishes to acknowledge the help of N. A. Rose of the U. S. Geological Survey who contributed valuable information on the characteristics of fresh water formations and on the interpretation of electric logs made in water wells. He is indebted also to the City of Houston Utilities Department, to the Humble Oil and Refining Company, and to the Fohs Oil Company, for their release of some of the electric logs presented.

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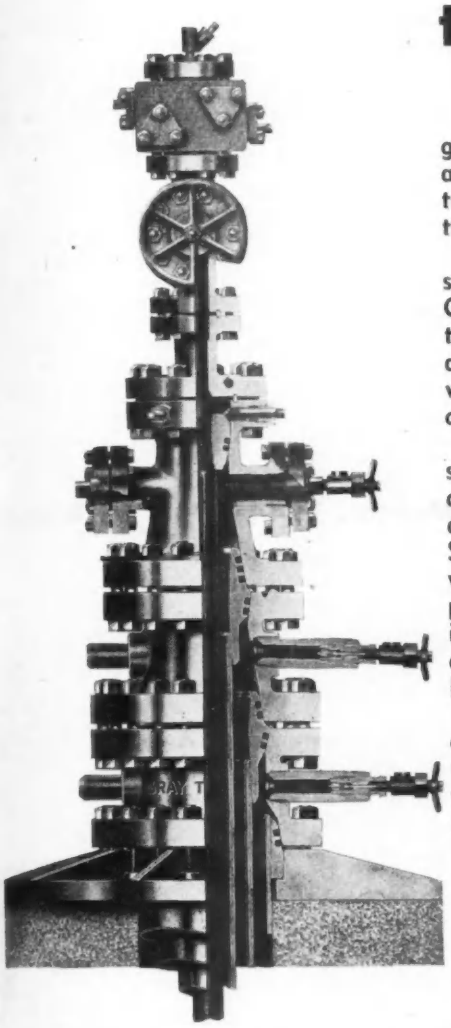

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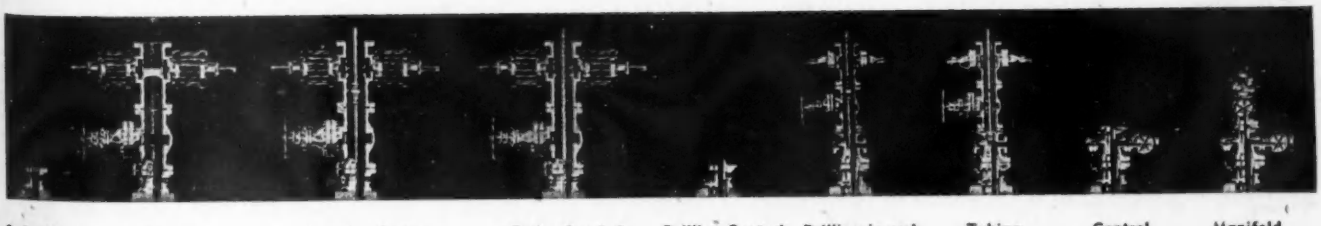

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Wildcatting Falls Short Of Indicated Need

THE OIL WEEKLY'S monthly record of exploratory drilling, and appraisal of new fields, new pay zones, and field extensions

Data compiled by District Editors and coordinated
By L. J. LOGAN, Associate Editor

ALTHOUGH exploratory drilling is running this year at the highest level since the country entered the war, it is not fulfilling requirements as recognized in the government's goal for this year. Results up to now indicate that unless development is intensified, there will be only about 4250 exploratory well completions in 1944, compared with the objective of 5000.

This failure to drill as many exploratory tests as desired is occurring in spite of the fact that drilling in general is proceeding according to the plan for 24,000 wells this year.

In the first 10 months of 1944, completions of exploratory wells averaged 83 per week, an increase of 18.5 percent over the 70 per week of the corresponding months last year. By comparison, total drilling showed an increase of 27.5 percent over the 10 months of last year (THE OIL WEEKLY, Nov. 13, 1944, page 56.)

The significance of these figures is that forces are at work which tend to defeat all efforts to invoke the intensified exploration considered essential for maintaining producing ability. In so far as the Petroleum Administration for War is failing to gain the objective which it considers necessary, a highly vital phase of the prosecution of the war is unsuccessful.

This lagging of exploration below essential levels has not had so far any disastrous results, but only because of the comfortable surplus of producing ability that was available on entering the war. That surplus now is gone, and the need for new producible reserves has become an immediate, urgent requirement.

The forces which are working against fulfillment of the essential volume of exploratory drilling are both physical and economic. There are still difficulties in connection with materials, equipment, manpower, transportation. It also appears at times that new reserves are becoming increasingly hard to find. But probably the most powerful force at work against a higher volume of wildcatting is an economic force, namely, the restrictive influence of wartime control. What the leaders of the industry have been warning against since 1942, and what the Petroleum Administration for War itself has clearly recognized and sought to prevent, is now happening. Uncompromising, arbitrary fixing of crude prices at prewar levels, in the face of sharply increased costs and taxes, has worn down the initiative of operators throughout the land, and they are not finding all the new oil that is wanted and needed. Insufficient incentive is drawing forth insufficient new producing ability. And the lack of new reserves now is forcing excessive, uneconomic, wasteful operation of many wells, to meet the nation's emergency requirements of petroleum products. While deplorable, this unsound drawing on older fields because of the lagging of exploration was foreseen and warned against

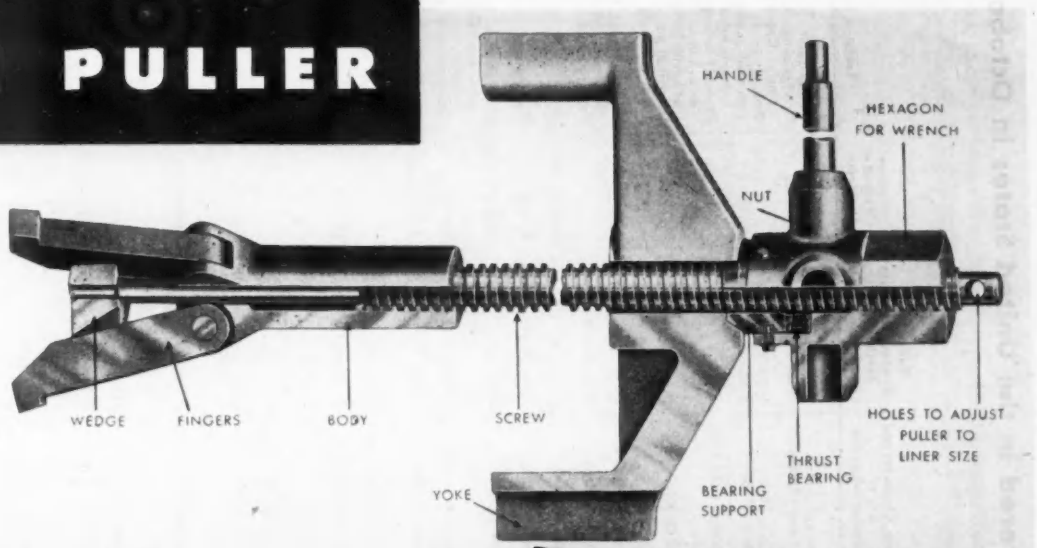
■ CONTINUED ON PAGE 62
TABLES ON PAGES 60, 61

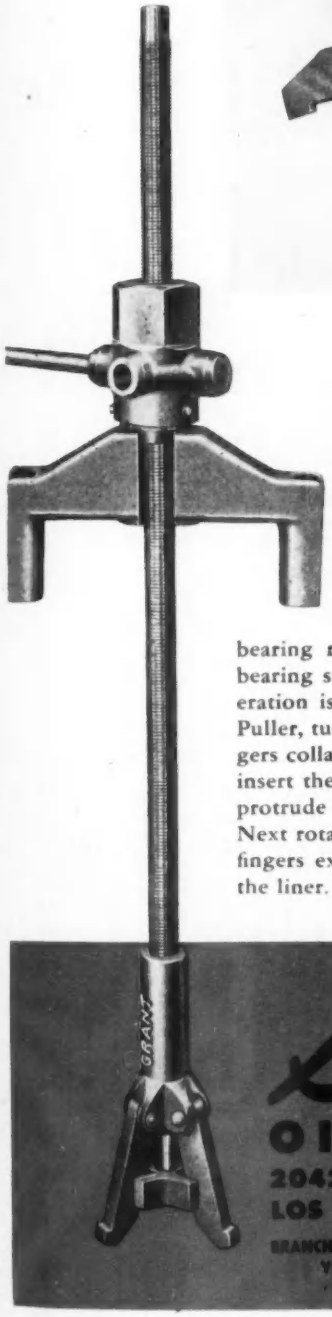
Results of Exploratory Drilling in October and First 10 Months, 1944-1943, by Districts

	OCTOBER, 1944															FIRST TEN MONTHS, 1944															
	Productive Tests										Unproductive Tests				Total Exploratory Tests	Productive Tests									Unproductive Tests			Total Dry		Total Exploratory Tests	
	New Fields			New Pays			Extensions			Total Productive						New Fields[1]			New Pays			Extensions			Total Productive							
	Oil	Gas	Dis.	Oil	Gas	Dis.	Oil	Gas	Dis.		Wildcats	New Pays	Outposts	Total Dry		Oil	Gas	Dis.	Oil	Gas	Dis.	Oil	Gas	Dis.	10 Mo. 1944	10 Mo. 1943	Wildcats	New Pays	Outposts	10 Mo. 1944	10 Mo. 1943	10 Mo. 1944	10 Mo. 1943
Alabama											1			1	1	1						2			3		15		2	17	2	20	2
Arizona																											6			6	4	6	4
Arkansas											5			5	5	2		2				4			8	11	56		1	57	56	65	67
California											11			11	11	13	7		4	1		4	1		30	21	223		1	224	129	254	150
Colorado																1				1		3			5	1	5			5	4	10	5
Florida											2			2	2												3			3	4	3	4
Georgia											1			1	1												8			8	2	8	2
Illinois	6						2			8	15			15	23	21		1	29			22			73	118	287			287	300	360	418
Indiana	1									1	12			12	13	7			1			2			10	7	61			61	74	71	81
Iowa																											2			2	3	2	3
Kansas	4									4	43			43	47	44	11					4			59	53	356		6	362	344	421	397
Kentucky											12			12	12	12	5	4	3			2			26	19	101			101	91	127	110
Louisiana	2		1	2						5	8			8	13	8	3	6	10	1	3	3		1	35	35	95		16	111	91	146	126
North			1							1	6			6	7	2	2	2		1	1	1		1	10	11	59		12	71	75	81	86
South	2			2						4	2			2	6	6	1	4	10		2	2			25	24	36		4	40	16	65	40
Michigan	1	1								2	20	1	2	23	25	10	2		2			2			16	25	180	2	2	184	167	200	192
Mississippi											5			5	5	2		1				1			4	5	61		11	72	49	76	54
Missouri											1			1	1											3	6			6	18	6	21
Montana											8			8	8		3		1			1			5	6	25		1	26	15	31	21
Nebraska											1			1	1												8			8	29	8	29
New Mexico	1									1	3			3	4	3	3		1			2			9	6	43			43	42	52	48
Ohio		2					2	1		5	6			6	11	2	18					4	17		41		64			64		105	
Oklahoma	5	1		2	1		1	1		11	19			19	30	31	13		5	3		11	3		66	46	192		3	195	233	261	279
Tennessee																											4			4	1	4	1
Texas	11	2		1			3			17	85	2	3	90	107	102	21	10	49	6	6	45	5	8	252	174	1018	14	21	1053	783	1305	987
E. Tex. Bord.											2			2	2								3	2	5	3	13			13	3	18	6
Rest E. Texas											5			5	5	5			7		1				13	8	92	1	1	94	72	107	80
North Texas	5									5	19	1		20	25	31	1		14	1		6			53	51	245	3		248	188	301	239
W. Central	1									1	11		2	13	14	10			7	1					18	13	96	1	2	99	96	117	109
West Texas	2						1			3	14	1		15	18	17	2		4			17			40	18	141	7	5	153	62	193	80
Panhandle											1			1	1												6	1		7	3	7	3
Upper Coast	1			1						2	8		1	9	11	8	3	2	4	2	2	6	1	2	30	21	108		4	112	74	142	95
Lower Coast	1	2					1			4	11			11	15	21	11	7	8	1	3	7	1	3	62	40	149		6	155	130	217	170
Southwest	1						1			2	8			8	10	8	4	1	4	1		9			27	19	120		3	123	114	150	133
S. Central											6			6	6	2			1					1	4	1	48	1		49	41	53	42
Utah																												1		1		1	
West Virginia																	2								2		2			2		4	
Wyoming	2									2			1	1	3	7			5	1		2			15	11	13		3	16	8	31	19
Total U. S.	33	6	1	5	1		8	2		56	258	3	6	267	323	266	88	24	110	13	9	114	26	9	659	541	2834	17	67	2918	2449	3577	2990

Grant LINER PULLER

MODEL 8443





PULLS ALL SIZES OF REMOVABLE LINERS (3½" TO 9" INCLUSIVE) FROM ANY PUMP

The GRANT Liner Puller will pull all sizes of removable liners from any pump. Two sizes cover the complete range—3½" to 5" inclusive, and 4½" to 9" inclusive.

All stressed parts are made of highest quality heat-treated alloy steels. Simple in design — no loose parts to become lost. Roller thrust bearing reduces friction and combined with bearing support provides extra strength. Operation is easy. To insert the GRANT Liner Puller, turn the screw clockwise until the fingers collapse enough to go in the liner. Then insert the Puller in the liner until the fingers protrude beyond the inner end of the liner. Next rotate the screw anti-clockwise until the fingers expand enough to contact the end of the liner. Then place the yoke over the end of the cylinder straddling the studs. Now rotate the nut assembly clockwise for the pulling operation. If additional leverage is required, a 48" pipe wrench can be used on the hexagon extension of the nut without injury to the roller bearing assembly. To remove the GRANT Liner Puller, simply rotate the screw clockwise.

Mail the Coupon for further details about the Liner Puller and other GRANT Tools.

Grant OIL TOOL CO.
2042 EAST VERNON AVENUE
LOS ANGELES 11, CALIFORNIA
BRANCHES: AVENAL, BAKERSFIELD, SANTA MARIA, VENTURA, CALIFORNIA; ODESSA, TEXAS

GRANT OIL TOOL CO.
2042 EAST VERNON AVENUE,
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☐ Bailers ☐ Cleaners ☐ Hole Enlargers ☐ Liner Pullers
☐ Reamers ☐ Shale Bits ☐ Underreamers ☐ Wall Scrapers
☐ Safety Automatic Pressure Releases (Mud Pumps)

New Oil and Gas Fields and New Pay Horizons Discovered in the United States in October, 1944

Also Important Extensions to Established Fields

COUNTY	FIELD	COMPANY, WELL AND LOCATION	Date Spudded	Date Completed	Total Depth (Feet)	Completion Horizon (Feet)	[1]Name, Character and Age of Producing Formation	[2]Initial Production Method and Choke	Gravity of Oil	[3]Structure: [4]Method of Discovery	Tentative Evaluation of Discovery or Extension
		ILLINOIS—New Oil Pays									
Franklin	N. Benton	Markham's Old Ben Coal A-6, ne nw nw 1-6s-2e	8- 3-44	10-17-44	2458	2427-2458	Cypress sd; Miss.	P 10 168 wtr	....	.....	Unimportant.
Jefferson	Boyd	Superior's Price 4, ne se sw 13-1s-2e	10- 8-44	10-31-44	2158	2134-2158	Aux Vases sd; Miss.	P 453	....	.....	Good possibilities. Aux Vases dry hole 1½ mi w., Bethel test 1 mi e. Untested area of sevrl sq mi to n.
Jefferson	W. Divide	Texas Co.'s Green 4, ne se ne 12-1s-3e	8-31-44	10-10-44	2854	2680-2688	Levias li; Miss.	P 129 33 wtr	....	.....	Probably small. Fld producing in McClosky li.
Lawrence	Lawrence	Big Four-Ashland-Sumner's Griggs 1, sw ne ne 13-3n-13w	7-20-44	10-24-44	2049	2022-2032	Levias li; Miss.	P 22	....	.....	1 mi w of Lawrence Co pool on w slope of ant. Levias not formerly recognized in Old Lawrence Co. pool.
Richland	Calhoun	Phillip's Richland 1, ne se se 6-2n-10e	9- 1-44	10-17-44	3163	3150-3161	St. Genevieve li; Miss.	P 577	....	.....	Probably medium-sized pool. Dry holes limit new pay 1¾ mi w, 1 mi se. Pay of discov well, comp Aug 1944, reported as Levias but may be McClosky.
Wabash	Mt. Carmel	George-Wrather's Crow 1, se se sw 32-1n-12w	9-15-44	10-24-44	2400	2310-2330	Levias li; Miss.	P 85	....	.....	1st well in pool to call prod zone Levias, but Levias penetrated in many McClosky wells in pool.
		ILLINOIS—Oil Field Extensions									
Clay	Iola	Texas Co.'s Rose 1, nw se ne 10-5n-5e	8-20-44	10-24-44	2559	2145-2165	Cypress sd; Miss.	P 27; 5 wtr	....	.....	Probably small. Is ¾ mi n of Iola pool, separated by dry holes. Dry Cypress tests 1 mi n, ¼ mi sw.
White	Storms	Skelly's McCarty 1 ne ne nw 7-6s-10e	9- 1-44	10-24-44	3173	2698-2703	Cypress sd; Miss.	P 17; 30 wtr	....	.....	Probably small. Dry Cypress tests 1 mi n, 1 mi s.
		INDIANA—									
Grant	.....	J. C. Reynolds' Knight 1, ne ne sw, 8-23n-8e	.....	10- 6-44	1044	997-1044	Trenton sd; Ord.	P 5	....	Ant.	.....
		KANSAS—New Oil Fields									
Barton	.....	Vicker's Pet. Co.'s Workman 1, nec 33-20s-12w, 2½ mi sw Silica pool.	.....	10- 5-44	3455	3410-3455	Arbuckle li; Ord.	P 49; 16 wtr	36	F; sub.	Unimportant.
Ellis	.....	Sunray's Younger B-1, se se ne 6-14s-17w, 2½ mi w Toulon pool	.....	10- 7-44	3583	3525-3574	Arbuckle li; Ord.	P 75	38	Ant; grv-seis	Small area but wells likely to be very productive: Toulon pool (Arbuckle) wells have produced their daily allowables for more than 7 years.
McPherson	.....	Bay-Westgate Greenland's Meyers 1, nec nw 7-19s-1w, 4½ mi ne Galva.	.....	10- 2-44	3170	2952-2956	Kinderhook sdy sh; Miss.	P 100	....	Str trp; seis-sub.	May develop oil prod on nw flk Ritz-Canton area.
Pratt	Shriver	Skelly's Shriver 1, nec 33-29s-14w, 4 mi sw Coats pool	.....	10-14-44	4679	4557-4561	Simpson sd; Ord.	F 344	36	Ant; seis-sub	Appears important strike alg Coats-Sun City trend; may become major pool.
		NORTH LOUSIANA—New Distillate Field									
Bienville	.....	George H. Pearce's E. W. Merritt 1, 1663 fr sl 1638 fr wl 13-17n-7w	7-26-44	9-30-44	7661	5692-5710	Cotton Valley sd; Jur.	F 2.5 mln	dist.	.....	Old well worked over.
		SOUTH LOUSIANA—New Oil Fields									
Jeff Davis	Bayou Serpent	Continental's King Corp 1, 1660 n, 330 w of sec 30-7s-6w	.....	10- 5-44	9302	7135-7145	Ortego sd; Olig.	F 178; $\frac{3}{32}$"	35.7	D; seis	1-well reserve 180,000-200,000 bbl.
Jeff Davis	W. Tepetate	Barnsdall's P. & M. D. Miller 1, start common cor sects 36, 38, 39, go ne alg nwl sec 38 for 3040 th se at ra to len in 38-7s-3w.	7-17-44	9-30-44	10032	8516-8548	Frio sd; Olig.	F 793.8; ¼"	34.8	Flt; seis	Est 5,000,000 bbls reserve.
		SOUTH LOUISIANA—New Oil Pays									
Acadia	Branch	Union Sulphur Co.'s J. P. Gueno Est. 1, start nec sec 51 go alg nel 6830 ft th sw at ra 600 to len in 51-8s-2e.	6- 5-44	9-29-44	11316	11044-11104	Frio sd; Olig.	F 177; $\frac{5}{32}$"	45.5	.....	1-well reserve 300,000-320,000 bbls.
Plaquemines	Potash	Humble's Orleans Levee Board 66, start n of nec sec 13 go swly on nwl 6706 th sely at ra 140 to len in 13-18s-15e.	6-28-44	8-17-44	1918	1802-1820	Sd;	F 72; $\frac{4}{64}$"	18.8	.....	.....
		MICHIGAN—New Oil Field									
Bay	Fraser	Shell's Koth 1, sw ne nw, 2-16n-4e, 2 mi s Pinconning	8-20-44	10- 5-44	3012	2890-2940	Dundee li; Devo.	F 940; 5 mln.	36.8	Ant; seis.	15 feet pay cored, possibly more unreported; probably like Arenac flds, small in area but highly prolific, some running 10,000 bbls acre.
		MICHIGAN—New Gas Field									
Ogemaw	Logan	Sun's Holshoe 1, n½ sw se 17-22n-4e, 13 mi e W Branch	6-27-44	10- 4-44	4537	1408-1440	Berea sd; Miss.	F 7 mln.	....	Ant; geol.	Td in Richfield.
		NEW MEXICO—New Oil Field									
Lea	.....	Gulf's V. H. Drinkard 1, c ne nw 30-22s-38e, 2¼ mi e Penrose fld, nearest.	7- 8-44	10-25-44	6508	6375-6460	Clear Fork li; Perm.	F 1341; ¾"	38.8	Ant; geop-geol	Important; 1st oil prod for county below regular Permian; emphasizes possibilities of deep prod within and near fields not yet given equivalent test.
		OHIO—New Gas Field									
Lorain	.....	Hanley & Bird's L. W. McConnell 1, Lot 19, n cent Wellington twp	.....	10- 5-44	2304	2269-2278	Clinton sd; Sil.	F 0.9 mln	....	.....	No estimate.
Morgan	York	Foraker's New York Coal Co. Fee, sec 34 w part York twp, se Crookville.	.....	10-15-44	3823	3782-3822	Clinton sd; Sil.	F 1.6 mln	....	.....	Rock pres. 1100 lbs.
		OHIO—Oil Field Extensions									
Meigs	Bedford	Preston Oil Co.'s Margaret Hauck 1, sec 2	.....	10-12-44	1630	1619-1630	Berea sd; Miss.	F-S 25	....	.....	¾ mi s extension.
.....	Hinckley	H. A. Dempsey's H. S. Botzow, lot 7, Hinckley twp	.....	10-25-44	3218	3050-3126 3215-3218	Newburg sd;	F 20; 0.27 mln	....	.....	Extends Hinckley pool 1 mi n.
		OHIO—Gas Field Extension									
Guernsey	Wheeling	Ohio Fuel Gas Co.'s Vollman-Kenedy 1, sec 6, Liberty twp	.....	10- 5-44	3333	3326-3333	Oriskany sd; Devo.	F 0.46 mln	....	.....	½ mi s extension.
		OKLAHOMA—New Oil Fields									
Garvin	.....	Sinclair-Prairie's Allred 1, ne nw se 20-3n-3e, 7 mi e E. Pauls Valley pool.	.....	10- 2-44	1918	1879-1918	Simpson sd; Ord.	P 112; 2 wtr	26	Flt ant; seis	Structure apparently narrow; sand prolific; 1st well indicates fair prod.
Lincoln	.....	Sinclair-Prairie's Danker 1, se nw se 28-14n-3e, 7 mi sw Chandler	.....	10-18-44	5346	3475-3490	Cleveland sd; Penn.	F 138	55	Ant; seis	Good strike; may be 1800-ac. structure; Cleveland sd is prolific, oil is high grav.
Logan	.....	Kerlyn Oil Co.'s Green 1, se sw 36-18n-4w, 1 mi sw of N. E. Crescent pool.	.....	10- 5-44	4855	4807-4833	Layton sd; Penn.	F 136	....	Ant; seis	Structure may be limited to a section. Sand is prolific.
Logan	.....	Eason Oil Co.'s Michael 1, sw sw sw 12-17n-4w	.....	10-17-44	4949	4902-4929	Layton sd; Penn.	F 90; 3 mln	....	Ant; sub.	Structure may cover a section; fair strike.
Osage	.....	Peters Pet Co.'s Osage 2, sw se nw 35-20n-11e, 1½ mi s Sand Spgs.	.....	10-12-44	2490	2415-2490	Hominy sd; Ord.	P 50	40	Ant; sub.	Well marks new Hominy sd prod for Bruner (Arbuckle) area.

COUNTY	FIELD	COMPANY, WELL AND LOCATION	Date Spudded	Date Completed	Total Depth (Feet)	Completion Horizon (Feet)	[1]Name, Character and Age of Producing Formation	[2]Initial Production Method and Choke	Gravity of Oil	[3]Structure: [4]Method of Discovery	Tentative Evaluation of Discovery or Extension
		OKLAHOMA—New Gas Field									
Pontotoc	.....	H. W. Shaw's Logsdon 1, ne nw se 32-5n-6e, 5 mi n Ada	.....	10-21-44	1920	1781-1791	Cromwell sd; Penn.	F 13.5 mln	.....	Ant; sub-dr.	Undetermined.
		OKLAHOMA—New Oil Pay									
Carter	Graham	Continental's Fowler A-1, nw se sw 31-2s-2w	.....	10-20-44	5470	5410-5450	Hunton li; Devo.	F 2184; 1"	39.5	Ant; dr.	Important; fld prod fr shallow Penn. sd; will stimulate deep drlg in this and other s Okla flds.
Cleveland	.....	Deep Rock's Harris 1, ne nw ne 11-10n-1w, 1½ mi w Stella pool	.....	10-10-44	5940	5932-5940	Bartlesville sd; Penn.	P 58; 45 wtr	38	Flt; seis	1-well pool offset by dry hole ½ mi w.
		OKLAHOMA—New Gas Pay									
Logan	W. Edmond	Cities Service's Gafney 1, se ne 29-15n-4w, n end pool	.....	10-15-44	6980	6420-6497	Bartlesville sd; Penn.	F 10.8 mln.	.....	Str, trp; dr.	Well dry in Bois D'Arc; 1st big gasser for W. Edmond.
		OKLAHOMA—Oil Field Extension									
Oklahoma	W. Edmond	Magnolia's Talbot 1, nw nw 28-13n-4w	.....	10-12-44	7067	6970-7058	Bois D'Arc li; Devo.	F4560; 1.5mln	36	Str, trp; dr	Important; extends pool 1 mi s.
		OKLAHOMA—Gas Field Extension									
Texas	Hugoton	Phillips' Hazel 1, sw ne 35-1n-1eecm	.....	10- 2-44	2941	2930-2941	Big Lime li; Perm.	F 10.5 mln	.....	Ant; dr	Extends Hugoton gas pool 4 mi s.
		NORTH TEXAS—New Oil Fields									
Archer	.....	A. P. Kouri's W. A. Keys 1, 1208 ft wel, 980 ft snl of E-120-ac tr, J. M. Swisher sur A-396.	7- 3-44	10- 4-44	1119	1114-1119	.....	P 8; 2 wtr	.....	Ant; geol.	Unimportant
Jack	.....	Hanlon-Buchanan's C. M. Matlock 1, 467 ft out swc of 50-ac lease, A. H. Latimer sur A-363, se edge E. Bryson fld (Strawn).	8-29-44	10-24-44	5344	5316-5344	Li; Miss.	F 255; $\frac{5}{32}$"	45	Ant; geop.	Single well reserve 240,000-320,000 bbls. Probably small prod area.
Cooke	.....	S. D. Johnson's J. S. Gatewood 1, 850 ft nsl and 330 ft wel of 215-ac tr, MEP&P Ry. sur A-766, 1⅛ mi e of T.C.U-Lynn pool.	9- 8-44	10-18-44	1585	1568-1581	Strawn sd; Penn.	P 157	35	Ant; geol.	Small but profitable pool; encourages exploratory work in general area.
Montague	.....	Continental's J. R. McNutt 1, ne se se sec 38, E. T. Ry-Burnett-McNutt sur A-1069, 4¼ mi sw Ketchum shallow pool.	7- 4-44	10-30-44	7299	6715-6730	Viola li; Ord.	F 266; $\frac{4}{16}$"	41	Ant; geop.	1st prod for state fr Viola; pay likely to be erratic.
Wilbarger	Odell	Fain-C. P. McGaha's G. K. Martin 1, se se nw H&TC Ry. 5, blk 11, 3 mi w by n of Fargo fld.	9- 7-44	10-16-44	4841	4747-4806	Palo Pinto li; Penn.	F 252; $\frac{4}{16}$"	39.8	Ant;geol-geop.	Involves same type, but deeper-seated structure th nearby Fargo multipay fld. Probably substantial prod area; single well reserve 200,000-240,000 bbls.
		WEST CENTRAL TEXAS—New Oil Field									
Taylor	.....	Texas Co.'s Henry Sales C-1, 440 ft nsl, 990 ft wel lot 9, Sayles sub-div, League 122, W. R. Willis sur, 1⅝ mi n Dunigan pool.	9-10-44	10-31-44	2285	2268-2284	Flippen li; Penn.	P 51; 1 wtr	.....	Ant; geol.	Small pool due to close proximity of failures.
Andrews	Emma-Holt	Texas Co.'s University-Magnolia L-1, c ne sw sec 41, blk 9, 1⅛ mi e of Emma fld's 430p-ft San Andres prod.	7-14-44	10-19-44	5520	5310-5330	Holt li; Perm.	F 541; 8⅝ wtr; 2"	33	Ant; geol.	2 mi sw Clabber Hill pool's single Holt zone pumper; 3½ mi n by e of Holt pumper in N. Cowden area. These reveal gradual dip of Holt pay to n. Regular Emma fld pay not present. Extent of prod area conjectural.
Ward	Lion	Lion Oil's University B-1, c ne ne sec 43, blk 18, 3¾ mi e of Delaware gasser.	6-24-44	10-25-44	4994	4979-4994	Delaware sd; Perm.	F 122; ¾"	36	Ant; geol.	May embrace substantial area: well higher structurally than abandoned oil discovs, 3 mi w by s and 2¾ mi to sw.
		WEST TEXAS—Oil Field Extension									
Winkler	Keystone-Holt	Falcon Co.'s W. A. McCutcheon-Humble 5, ne nw se psl sec 15, blk B-2, 1½ mi se nearest prod same zone.	.....	9-22-44	4872	4735-4745	Holt li; Perm.	F 1033; ½"	41.5	Ant; geol.	Orig comp Nov. '36 in fld's regular pay at 3208-3600 ft. Emphasizes possibility of this deeper Permian zone being prod under large gart of Keystone li area.
		UPPER TEXAS GULF COAST—New Oil Field									
Wharton	.....	Amerada's Chas. J. P. Daboval 1, 660 fr ndel 160-ac lse which is sw¼ sec 72.	8-18-44	10- 2-44	7430	7025-7028	Frio sd; Olig.	F 80; ⅛"	36.7	Flt; seis.	1-well reserve 80,000-100,000 bbls. 8 mi sw El Campo.
		UPPER TEXAS GULF COAST—New Oil Pay									
Chambers	N. Winnie	Sun's W. L. Evans 1, 3357 s 330 w of nec J. N. Duran Lge, 330 fr nl 330 fr el lot 11 blk 75 Wilson subdn 1155 sw Daugherty pool disc well 1.	6-13-44	9-10-44	1070	9434-9451	Frio sd; Olig.	F 61; 3.124 mln $\frac{8}{16}$"	49.3	Flt; seis.	.....
		LOWER TEXAS COAST—New Oil Field									
Refugio	.....	P. R. Rutherford's Smith-Crow 1, 467 n of sl 290-ac lse, 467 e of Mission River Line, Estevan Lopez Lge, sec B&C.	8- 1-44	10-16-44	6506	5400-5404	Frio sd; Olig.	F 82.5; ⅛"	24	Ant; geol-seis.	Probably small area. 8 mi s Woodsboro.
		LOWER TEXAS COAST—New Gas Fields									
Lavaca	.....	Moran Co's (was Jack Frazier's) Joe W. Lell 1, (OWWO) 620 fr wl 700 fr nl 40-ac tr n½ of e 75-ac of L&L lse, Jas. Kerr sur 9.	4-16-44	9-29-44	7690	5872-5877	Wilcox sd; Eoc.	F 2 mln	.....	.....	Went dead as oil well; too much water; recomp as gas well. 4½ mi sw Hallettsville.
Victoria	.....	Kingwood Oil Co.'s M. F.Bass A-1, 330 fr sel 990 fr swl 73-ac lse, Lot 6 Rge 11 660 nw Bass 1 blowout.	.....	10-10-44	4957	4957-	Frio-Vicksburg sd; Olig.	F 20 mln.	.....	.....	.....
		LOWER TEXAS COAST—Oil Field Extension									
DeWitt	Slick	Transwestern Oil Co.'s Nettie Green 1, 330 fr nw&nel 150.8-ac lse, 2350 sw Continental's Fed. Lnd. Bnk. of Houston 2, Louis Von Roeder sur.	.....	.....	7654	7626-7654	.....	F 22; $\frac{3}{32}$"	35.3	.....	Relatively unimportant.
		SOUTHWEST TEXAS—New Oil Field									
Duval	Herbst	J. W. Gorman's A. Herbst 2, 330 fr wl 1320 fr nl H&GN sur 67, 2200 w sw Gorman's No. 1 dry hole on same lse.	6-30-44	9-25-44	2980	2832-2834	Vicksburg sd; Olig.	F 43; 60⅝ wtr	23	Flt; sub.	Unimportant.
		SOUTHWEST TEXAS—Oil Field Extension									
Starr	Garcia	Sun's M. M. Garcis B-1, 1322.7 fr el 467 fr sl 279-ac lse and tr D-1 porc 94.	9-24-24	10-19-44	4161	3908-3916	Vicksburg sd; Olig.	F 86.3; $\frac{5}{64}$"	47	.....	No estimate on present data.
		WYOMING—New Oil Fields									
Albany	N. Big Hollow	Oklahoma Oil Co.'s Union Pacific 1, c ne nw 7-15n-75w	.....	10-20-44	848	827- 848	Muddy sd; U. Cre.	Sw 144	22	.....	Est. good for 65 bbls day.
Park	Half Moon	Husky Ref. Co.'s Krampert-Unit 1, ne sw nw 23-51n-102w	.....	10- -44	4265	3425-3455	Lwr Embar sd; Perm.	Sw 35	16	.....	.....

[1] Character of producing formations abbreviated thus: ch, chalk; dolo, dolomite; li, limestone; sd, sandstone; sh, shale, ser, serpentine; cgl, conglomerate. Ages of formations abbreviated thus: Pleis, Pleisocene; Mio, Miocene; Olig, Oligocene; Eoc, Eocene; U. Cre, Upper Cretaceous; L. Cre, Lower Cretaceous; Jur, Jurassic; Tri, Triassic; Perm, Permian; Penn, Pennsylvanian; U. Miss, Upper Mississippian; L. Miss, Lower Mississippian; Devo, Devonian; Sil, Silurian; Ord, Ordovician; Cam, Cambrian.

[2] Barrels of oil per day (24 hr. rate), flowing (F), pumping (P), swabbing (Sw), or bailing (B); or million cubic feet of gas daily open flow capacity; size of choke given in inches. [3] Type structure abbreviated as follows: Ant, Anticline; D, Dome; Fld, Fold or Folded; Flt, Fault or Faulted; M, Monocline; N, Nose; SD, Salt Dome; Str trp, Stratigraphic trap; Syn, Syncline; Ter, Terrace. [4] Method of discovery abbreviated as follows: cd, core drilling; dr, drilling; geol, geology; geop, geophysics; grv, gravity meter; ran dr, random drilling; seis, seismograph; sub, subsurface geology; sur, surface geology.

October Exploration

■ CONTINUED FROM PAGE 58

more than two years ago, when industry committees and associations, supported eventually by PAW, began the long and futile effort to secure adjustment of crude price ceilings imposed by OPA. Today's situation at least offers vindication of those who counseled the price adjustments, if it does not afford conclusive evidence at last for the necessity of the adjustments.

However, there is no present indication that any lifting of price ceilings will occur, and continued deficiency of exploration is in prospect for 1945. In apparent assumption that there will be no new incentive for wildcatting, PAW has called for 5000 wildcats in 1945, as it did for 1944, although scheduling a total of 27,000 well completions in 1945 against the objective of 24,000 in 1944.

The industry drilled 19,212 wells in 1943, of which 3599 or 18.7 percent were exploratory tests. In 1944 it will drill approximately the 24,000 called for by PAW, but with only about 4250 wildcats now indicated, it will devote only 17.7 percent of all drilling to exploration. In 1945 the industry very probably will drill at least the 27,000 wells programmed by PAW, but inclusion of 5000 wildcats among them would involve 19 percent of the total in exploration, or a higher ratio than in the past two years, which appears unlikely.

It should be pointed out, furthermore, that even the goal of 5000 wildcats per year under present conditions appears ultra-conservative, if not definitely inadequate, considering that there was practically no net addition to reserves in 1943, while 1944 has put heavy strain on the nation's producing ability.

Another circumstance which is of much significance is the fact that statistics on current exploration are less favorable than they appear on cursory examination, when studied from the standpoint of oil discoveries, as against gas and distillate discoveries. In the first 10 months of 1944, exploratory completions per week were 18.5 percent above those last year, and total productive tests were up 21.8 percent, with the ratio of success about the same as last year. However, this was the net result of remarkably sharp gains in oil and distillate pool discoveries and extensions, as oil pool discoveries and extensions showed only moderate increases. Total oil discoveries, including new fields and new pay zones, were only 10.9 percent higher than last year, and oil field extensions showed an increase of less than 1 percent. In discovering new oil sources, much the better results have been obtained in opening new fields than in establishing new pay horizons, indicating that the possibilities of new zones in fields are diminishing and that it becomes increasingly necessary to resort to the more hazardous and more expensive drilling of entirely new areas. Oil field discoveries were up 15.6 percent in the first 10 months of 1944, while new oil pay discoveries were up less than 1 percent.

During October only 323 exploratory tests were completed in the United States, compared with 346 in September, an average of 81 weekly against 87. Furthermore, the ratio of success dropped to 17.3 percent from 19.9 percent, and only 56 productive tests were recorded for October against 68 in September. Oil discoveries, including fields and new pays, were nearly the same as in September, but there were fewer oil field extensions. Gas and distillate discoveries showed decreases.

Among the more important discoveries of October was one in Pratt County, Kansas, which was rated as a possible major strike, along the Coats and Sun City trend.

In New Mexico a discovery well in Lea County provided the state its first production from the Clear Fork formation (Permian), and was considered important because of showing possibilities of this deeper pay, below the regular Permian, in and near other fields of the district.

Oklahoma recorded nearly a dozen discoveries and extensions, a few of which were of considerable importance. A new field located in Lincoln County is yielding good production of 55-gravity oil and may cover around 1800 acres. Opening of Hunton lime pay in the shallow Graham field, Carter County, will lead to deeper drilling in other fields of southern Oklahoma. The important West Edmond field, Logan County, was extended a mile south, and the Hugoton gas field was extended 4 miles south.

A feature of North Texas development was the establishment of the first production for the state from the Viola lime (Ordovician), when a Montague County test was completed as an oil well at 6715-6730 feet.

In West Texas an October discovery in Ward County is expected to develop into a fairly good oil field.

Summary of Results of Exploratory Drilling

Completions are from weekly reports and cover 4 weeks in September, 1944; 4 weeks in October, 1944; 43 weeks in January-October, 1943; and 44 weeks in January-October, 1944

ITEM	Sept., 1944	Oct., 1944	TEN MONTHS JAN.-OCT. 1943	1944	Percent Diff.
Oil Discoveries	37	38	339	376	+ 10.9
New Fields	25	33	230	266	+ 15.6
New Pays	12	5	109	110	+ 0.9
Distillate Discoveries	5	1	20	33	+ 65.0
New Fields	4	1	15	24	+ 60.0
New Pays	1	.....	5	9	+ 80.0
Gas Discoveries	9	7	56	101	+ 80.3
New Fields	9	6	45	88	+ 95.5
New Pays	.....	1	11	13	+ 18.2
Total Discoveries	51	46	415	510	+ 22.9
Extensions to Fields	17	10	126	149	+ 18.2
Oil Fields	15	8	113	114	+ 0.9
Distillate Fields	1	.....	3	9	+200.0
Gas Fields	1	2	10	26	+160.0
Total Prod. Tests	68	56	541	659	+ 21.8
Dry Holes	278	267	2,449	2,918	+ 19.1
(Weekly Average)	70	67	57	68	+ 19.3
Wildcats	274	258	2,415	2,834	+ 17.3
New Pays	1	3	.....	17	.....
Outposts	3	6	34	67	+ 97.0
Total Expl'tory Tests	346	323	2,990	3,577	+ 19.6
(Weekly Average)	87	81	70	83	+ 18.5
Percent Productive: (Weekly Average)	19.9	17.3	18.1	18.4	.....
Percent Dry: (Weekly Average)	80.1	82.7	81.9	81.6	.....

LLOYD L. WAIT, veteran oil well supply man in the mid-continent area, has joined the sales staff of Charles Wheatley Company of Tulsa, in the mid-continent area.

Texas' Part in War Oil Reported by Association

Texas is responding to the call for oil to win the war by furnishing 93.6 percent of the national increase recorded this year in crude oil production, according to Texas Mid-Continent Oil and Gas Association. Figures of the United States Bureau of Mines show the national increase in crude oil production in the first eight months of 1944 over the corresponding period 1943 was 132,672,000 barrels and Texas' share amounted to 124,190,000 barrels.

On a cumulative basis, considering the three-year period since Pearl Harbor, in comparison with the three years before Pearl Harbor, Texas has accounted for 54 percent of the nation's increase in crude oil production and a like percentage of refined products for war.

"At current production rates, the United States will produce during the war period 4,552,480,000 barrels of crude oil by December 7—three years after Pearl Harbor. During the three-year period immediately before the outbreak of war the national production was 3,939,455,000 barrels, The difference, 613,025,000 barrels, represents the wartime increase.

"Based on present rates, Texas will produce 1,810,000,000 barrels of crude oil during the three-year war period ending December 7 or 332,000,000 barrels more than the 1,477,945,000 barrels for the three-year pre-war period. This is 54 percent of the national step-up of 613,025,000 barrels. The gain by all the other oil producing states is represented by the difference, 281,025,000 barrels," the report said.

Mississippi Oil Production Up 1835 Barrels in Month

Mississippi oil production in September increased 1835 barrels over August, with 16 new producers listed in a report by Governor Thomas L. Bailey, chairman of the state oil and gas board.

Bailey reported that 414 wells produced 1,402,076 barrels of oil in September, compared with 1,400,241 barrels from 398 wells in August.

Heidelberg field in Jasper County became the state's second largest producer with an increase of 38,211 barrels. Tinsley field in Yazoo County, the largest producing field, decreased 41,611 barrels with an output of 906,465 barrels from 317 producers.

Addresses API Group

Leo Ranney, director of operations for Ranney Wells, a division of Engineers, Limited, San Francisco, gave an illustrated lecture on drilling and producing horizontal wells at the November 21 meeting of the San Joaquin Valley Chapter of API, Bakersfield, Calif.

Other speakers were W. T. Woodward, consulting engineer and geologist, Taft, California, and Mortimer Kline, Los Angeles attorney.

Texaco Christmas

A Christmas gift of a $100 war bond will be purchased during the Sixth War Loan Drive for each of the more than 5000 employes of The Texas Company on military leave of absence. Last year each Texaco employe on military leave received a $50 war bond at Christmas.

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International Developments

Hungary's Oil Production Rises During War Period

Crude oil output from fields that have mostly been discovered and developed in Hungary during the war period rose from slightly more than 1,000,000 barrels in 1939 to nearly 7,000,000 barrels in 1942, according to British authorities.

First commercial production in Hungary began in 1937 in the Lispe area, between Lake Balaton and the border of Yugoslavia. Two other productive areas were subsequently developed. One is in the Tisza River Valley, north and northwest of Szentes. The other is on the southern flanks of the Carpathian Mountains, near Miskole. The latter field is connected by pipe line with a Danube barge port near Budapest.

Search for New Oil Fields In England Gains Impetus

The search for new oil fields in England has been expanded as a result of successful development of pools in The Weald area, south of London.

D'Arcy Exploration Company and Anglo-American Oil Company have been granted licenses to conduct geophysical surveys and drilling tests in five new areas in the eastern and southeastern parts of the country. Considerable thicknesses of Mesozoic and upper Paleozoic strata underly most of the region to the east of a line running from Bristol beyond Leeds.

Wells on Qatar Peninsula Planned by Iraq Company

Iraq Petroleum Company plans to resume drilling on the Qatar peninsula.

The first tests may be located near the site of two wells on the west side of the peninsula that were destroyed during a critical period of the North African campaign.

The principal structure along the west coast is directly in line with the producing structure on nearby Bahrein Island.

Barco Geology

The October Bulletin of the Geological Society of America contains a 50-page article on the geology of the Barco Concession, Colombia, by Notestein, Hubman and Bowler. A detailed geological map, in color, accompanies the article.

The American Association of Petroleum Geologists has obtained reprints of the article for distribution.

Eleven Wells Completed In Tibu Area, Colombia

Eleven producing wells had been completed by November 10 in the Tibu area north of the Petrolia field, Barco concession, Colombia.

All but three of the wells are shut in, pending further development of the two-dome structure and decision regarding installation of adequate pipeline facilities. A temporary line is carrying 1300 barrels daily from storage tanks at Petrolia. A larger cut-off line may eventually be laid from the Sagoc trunk line to the Tibu area.

Two Socuavo wells were being tested at completion depth November 10, two others were coring above the pay zone, and a fifth was ready to begin drilling. Tres Bocas 4 was waiting on materials.

Main Portion of Fuel Line Calcutta-China Finished

The main portion of a fuel pipe line which ultimately will reach from Calcutta, India, to China, by way of Burma, has been completed, according to an announcement from New Delhi, India.

"The line is of great importance from a logistical standpoint," said Lieutenant General Daniel I. Sultan, American commander in the India-Burma theater of war. When finally completed, the line will have twice the capacity of the Ledo road, which it was built to supplement. Chinese, Indian and American crews have done the work, directed by United States experts, and construction of the line is regarded as among the most remarkable engineering feats of the war.

500-Mile Tampico-Pacific Line Planned by Pemex

Petroleos Mexicanos, Mexican government oil monopoly, plans a 500-mile pipe line from the Tampico area to the Pacific port of Mazatlan, with completion due in 1948.

A shorter line will connect the northern fields in the Ebano-Panuco area with the industrial center of San Luis Potosi, and a third line will be laid between the producing area south of Vera Cruz and the port of San Benitos on the Pacific near the Guatemalan border. A shuttle line will be put in from one of the Tampico fields to Cardenas on the main line railroad. Cost of the four projects is estimated at $6,000,000.

Pemex has also announced completion of the first of 22 steel and concrete tanker vessels being built under lend-lease contracts in the United States for service between ports of the Gulf of Mexico and the Caribbean.

Floresanto 1 Drilling

Following a reaming job carried to 2218 feet, drilling has been resumed at the Floresanto 1, wildcat, located west of the Sinu River, 100 kilometers south of Covenas in northwestern Colombia. Early in November it was reported to be drilling below 3000 feet. Socony-Vacuum Oil Company and Tropical Oil Company hold equal interests in Sindicato De Inversiones, operators of the Floresanto concession.

Concessions Granted

Phillips Venezuelan Oil Company, with headquarters in Caracas, has been granted 750,000 acres of exploration concessions on 4 blocks of land in the states of Anzoategui and Guarico. The company has also obtained National Reserve leases covering three parcels in the Maturin area of Monagas, amounting to 26,0000 acres.

Texas Halts Operations On Venezuela Wildcat

The Texas Petroleum Company of Venezuela has stopped operations on its wildcat northeast of Tucupita, in the Delta Amacuro region of eastern Venezuela, located on a local closure along the Temblador-Caritos trend. The well was drilled to 9244 feet before being abandoned.

Oil Firm Vehicles' Rate Of Accidents on Decline

Information from 117 oil companies, operating 45,032 vehicles during 1943, disclosed that these vehicles traveled 612,927,541 miles during the year with 1.14 accidents in each 100,000 miles of travel. That is to say, each vehicle operated had one accident in 87,386 miles of travel, according to a summary by API.

During 1943, the 18,817 passenger cars reported separately in the report traveled 151,920 miles to each accident. The 25,985 trucks reported separately averaged 68,032 miles of travel to each accident. Accidents per 100 vehicles decreased from 17.3 in 1942 to 15.5 in 1943.

In response to the Institute's annual request for information concerning traffic accidents, 151 companies—operating 48,996 motor vehicles—reported their experience to the Department of Accident Prevention for the year 1943. This information has been compiled in the twelfth annual summary published by the Institute since 1932.

Firm Plans to Hold Jobs For 18 Men in Service

Reemployment of 18 former employes in uniform without discharging any of the present personnel is one aim in the program of Big Lake Oil Company, Texon, Texas, according to Charles E. Beyer, vice president and general manager.

"If we can possibly do it, we don't want to turn any (employes) loose," said Beyer. "We want to get by shorthanded right now and perhaps slack our work a little so we can take care of these men."

The company virtually stopped employing new men several months ago and plans to reduce the working week from 44 to 40 hours to provide more jobs.

Former employes in service receive a monthly news letter containing sports gossip, personal news, promotion announcements and other information.

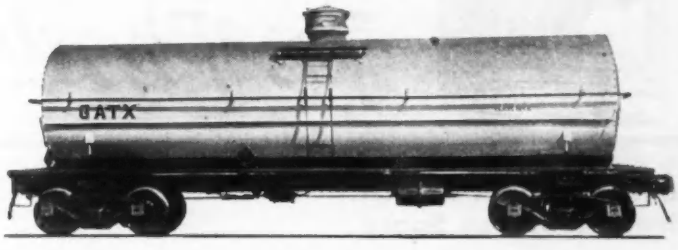
☆

J. M. WANENMACHER, division engineer and subsurface specialist with the Shell Oil Company, Tulsa, Oklahoma, for 12 years, has resigned effective January 1, to become associated in the petroleum engineering firm of C. H. Keplinger and J. M. Wanenmacher, Tulsa. The firm will specialize in valuation of oil and gas properties, reservoir studies, production problems, completion technique, secondary recovery and representation before regulatory bodies.

To Make Synthetic Rubber...

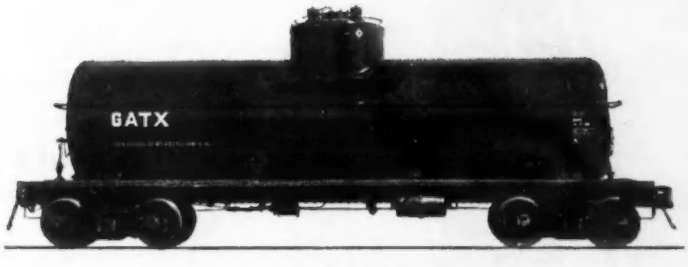
BUTADIENE...

must be carried at high pressure



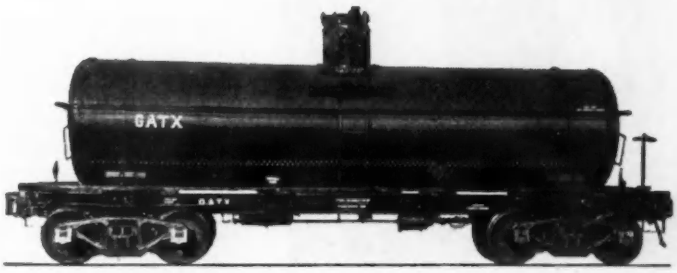
STYRENE...

requires special protection



SULPHURIC ACID...

is hard to handle



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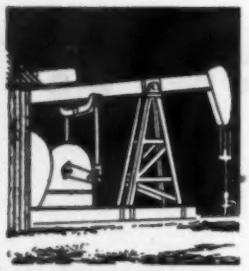
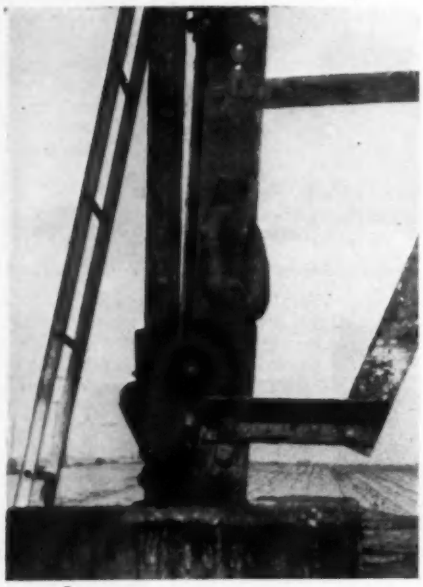


OPERATING HINTS *For Production Men*

Built-In Deadline Hitch Clears Working Space



Bracket fitted to derrick leg and anchored by angle bolts carries link for attaching dead line.

SERVICING EQUIPMENT

The dead-end anchor for the wire line used when pulling tubing and rods may be set in the leg of the derrick, instead of being placed in the concrete pad around the producing well. A section of heavy angle iron is punched with holes to match the holes in the leg where it is to be bolted to the foot piece on the supporting pier. A flat piece of heavy steel is cut to fit in the angle and pierced to receive the ring for the dead-end anchor.

To make the installation as strong as necessary, a fillet of steel is welded across the angle iron and to the edge of the flat piece of steel which contains the ring. All joints are securely welded. With this set-up nothing is on the ground to obstruct truck traffic, or cause operators to stumble, as when rings and loops are a foot or so above the ground level.

Prefabricated Guard Protects Fence Lines

LEASE PROTECTION

A portable cattle guard which can be quickly fabricated in the field is an innovation of a Kansas operator. During the spare time of the welder, 20 pieces of 2-inch junk pipe are cut in 10-foot lengths, also 4 pieces of junk 4-inch are cut to 12-foot lengths. In 2 of the pieces of 4-inch are cut holes approximately 2½ inches apart to receive the ends of the 2-inch. End pieces are formed, but not tacked to the 4-inch. These pieces are stacked in the pipe yard, and loaded onto the field truck with timbers when a guard is needed.

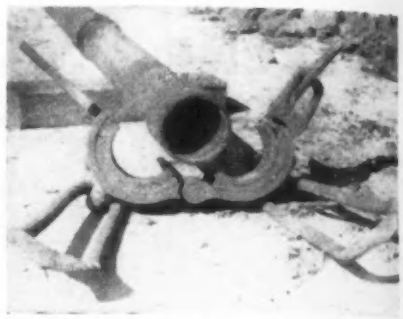
In the field, as the hole for the guard is being dug, the twenty 2-inch pipes are fitted into the 4-inch and the two end pieces welded to the 4-inch. Only the two 2-inch pipes forming the outside are welded, all intermediate pieces of pipe being free to turn when cattle tread on them.

The other two 4-inch pipes are used as stringers and are placed on timber sleepers so that wheels of vehicles pass directly over them when crossing the guard. The grill is then slid over the pit and stakes driven at the corners to hold it in place.

If the test prove dry, the grid can easily be moved as one piece, or separated into its component parts simply by cutting with the torch the 4 welds on the outside sections of the 2-inch pipe.

With 4-inch cross members and 2-inch roadway units cut and notched before assembly, welding of edge members forms guard which may be dismantled and quickly moved to new site.

Emergency Bushings Extend Elevator Use



Short sections of casing, split and welded within elevators, bush down units for handling smaller pipe.

CASING ELEVATORS

When an operator needed a set of 4-inch elevators in a hurry, and for only a short job, existing equipment was altered to fit, rather than spend the time and energy to seek out the desired unit. Short pieces of 5½- and 6⅝-inch casing were split and then nested for welding within the 6⅝-inch elevators which were handy. The resulting job was the equivalent of the desired 4-inch elevators, and worked satisfactorily.

The 4-inch casing job completed, the reducing bushings were cut from the elevators with the torch, leaving the unit again ready for use on the designed size of casing.

Spare bushings are now kept in the tool house, the appropriate size being welded within the large diameter elevators as each job is tackled. Having but few casing jobs, and with various diameters of the pipe to be handled, this emergency sizing of one elevator unit saves the material which would otherwise be tied up to provide special elevators for each diameter of pipe.

Centralized Testing Simplifies Control

SAMPLING DEVICE

Test cocks can be attached to lead lines to provide quick means for the pumper to determine operating conditions, and, when the individual lines are led to a distribution manifold at the separators, a uniform application will cut down the time required for obtaining samples or observing pumping rates. These cocks are attached to the under side of the lines by welding stand-

Test cocks, set in group on manifold, center sampling, while swage drains insure site cleanliness.

ard pipe nipples of the desired size to the pipe.

Bull plugs inserted in the lower threaded side of the valve body help to prevent dirt and abrasives from accumulating. Waste oil funnels, simply swedge nipples, are placed on the waste line so each cock will drain into a separate funnel. Waste oil in this setting flows to a common sump from which it is recovered by pumping to tankage as frequently as necessary.

Auxiliary Muffler Reduces Fire Hazard

Repair work must be carried on at all times with the utmost regard for safety, especially with regard to fire hazards. When gasoline engines are used to drive mobile air compressors or welding machines, the operator sometimes requires the machine in areas where extreme fire hazard exists, such as the tank farm. The engine exhaust probably presents the greatest danger in a setup of this kind.

LEASE FIRE PROTECTION

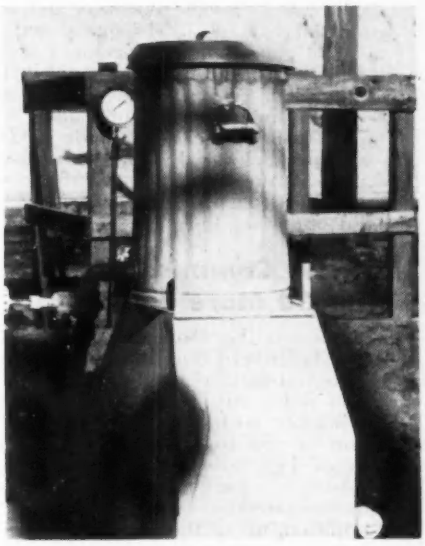
A simple method of preventing hot exhaust gases and carbon sparks from reaching the atmosphere is to provide an additional shop-made muffler in series with the standard muffler. This additional muffler can be made of 6-inch lightweight pipe and should contain no baffles to cause back pressure on the engine. The 6-inch pipe should be about 8 inches long and have the ends closed. Two 1½-inch pipes about 3 inches long should be welded in the side for discharge. The single intake enters on the opposite side.

Second muffler, attached beyond usual unit, snubs possible spark menace and quiets pulsations.

Galvanized Can Serves As Chemical Container

To reduce the number of trips required to fill the supply tank on the chemical feeder — originally of 5-gallon capacity — one company took from warehouse stock a number of heavy galvanized garbage cans and altered them slightly to serve as storage units. In the side of the can, and spotted slightly above the bottom to allow sediment space, was soldered a fitting for carrying the end of the line to the proportioning pump.

EMULSION TREATMENT



Large galvanized can holds fluid for long runs, simplifying rounds of service truck for refills.

A light steel base, with flange for holding the bottom rim of the can, was set up over the pump unit to provide gravity feed for the fluid and the can held in place by the fit between rim and boss on the flange.

The usual cover or lid was retained, the fit being close enough to exclude most dust and dirt, while at the same time permitting the entry of air to fill the void created by the gradual withdrawal of fluid by the pump.

With such a reservoir, the service-truck trips to replenish chemical supply were cut to one-seventh those necessary with the original equipment.

$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

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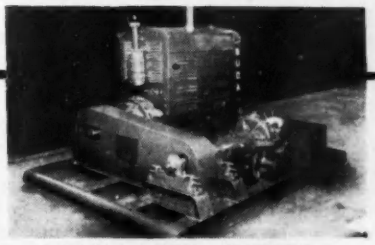

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Pipe Line Review

Permit Received to Lay 79-Mile Texas Pipe Line

Dow Chemical Company has received government permission to lay a 79-mile, 4-inch pipe line from Humble Oil & Refining Company's cycling plant at the Katy field to the firm's chemical plant at Freeport, Texas.

A mixture of butane-ethane-propane, produced by Humble as a by-product, will be transported. A number of high-pressure tank cars, which have been transporting this gas, will be released for service elsewhere. The cost, including high-pressure storage capacity at Freeport, will exceed $842,000. Daily capacity will be 2500 barrels of liquefied gas.

232-Mile Casper-Elk Basin Line in Wyoming Complete

Laying of Stanolind Pipe Line Company's 232 miles of 12-inch oil line in the Big Horn Basin of Wyoming between Casper and Elk Basin has been completed and the line filled with oil.

The line ties into Stanolind's regional interstate system reaching some of Wyoming's largest new oil reserves. Connections have already been made with the Elk Basin, Little Buffalo and Gebo Dome pools and handling of crude will be further facilitated by completion of a 31-mile cut-off from Casper to Welch. This part of the project was a relocation of the combined 8-inch and 12-inch line from Salt Creek to Welch which was relaid, eliminating a circuitous route to Welch from Salt Creek and Casper.

Pumping stations are still being installed with stations located at Elk Basin and Kirby and another at Oregon for Oregon Basin crude. Contractors were I. C. Little of Dallas, who had about two thirds of the project, and Sharman & Allen of Houston. From Casper the line crossed the Owl Creek Mountains, partly following an old stage coach road instead of crossing Wind River Canyon.

Oil will be handled by the Stanolind Crude Oil Purchasing Company, and because of the importance of the new line, C. W. Butler, superintendent of the Rocky Mountain district, has moved headquarters from Kearney, Nebraska, to Casper.

200 Miles of New York Line to Be Reconditioned

Socony-Vacuum Oil Company, New York, has awarded a contract to O. C. Whitaker Company, Fort Worth and Houston, to recondition approximately 200 miles of 6-inch products lines along the Erie canal in New York state. This work will be done in sections along with laterals to cities on the route.

Larger Line Is Planned From Mississippi Pool

Oklahoma Pipe Line Company, which has almost completed its gathering system in the Heidelberg, Mississippi, oil pool, plans to replace a 4-inch line from the field to its tank farm a mile away with an 8-inch line to take care of additional well connections. The company also has two 5000-barrel tanks for temporary storage at its loading racks.

In the Eucutta pool, Oklahoma Pipe Line has a 6-inch system to storage tanks at a loading rack at Hiwanee, and all wells of the Gulf Refining Company have been tied into the system and connections are being made with Humble Oil & Refining Company wells in the same pool.

Permit Sought to Export Natural Gas to Mexico

Reynosa Pipe Line Company, Corpus Christi, Texas, has filed an application with the Federal Power Commission to export up to 60,000,000 cubic feet of natural gas per day to Mexico.

The company explained it has entered into a contract with Gas Industrial de Monterrey, S. A., for purchase of the gas for a period of ten years from next February 15, or the date of completion of facilities, whichever is first.

It is proposed to obtain the gas from the La Blanca, South Weslaco and/or North Weslaco fields in Hidalgo County, Texas, and construct the necessary pipe line facilities, to consist of a 12-inch main line from a point on the American side of the international boundary to the north bank of the Rio Grande River and two parallel 8-inch lines from that point across the river to a connection with the Mexican company at the international boundary line.

Maritime Commission to Build 130 More Tankers

Tankers totaling 586 have been built by the Maritime Commission since it began its oil-carrier program in 1939 with 130 more still to be constructed.

Starting out with a program for construction of 459 16,000 deadweight ton tankers of 14½ to 16-knot speeds, the commission has produced 363 so far, its records indicated.

In addition, up to the end of October it had built 62 emergency liberty tankers, about 11-knot speed; 108 private tankers of 12½ to 16-knots, and 53 coastal tankers with a speed of 12 knots.

18 Miles of 8-Inch Line Being Laid Near Natchez

Oklahoma Pipe Line Company is laying 18 miles and a river crossing of 8-inch oil line near Natchez, Mississippi. O. C. Whitaker Company, Fort Worth and Houston, has the contract.

To Take Up Line

Sharman & Allen, Houston contractors, have received a contract from Gulf Refining Company to take up 6 miles of 6-inch line near El Dorado, Arkansas.

Line to Be Relaid

O. C. Whitaker Company, Fort Worth and Houston, has been awarded a contract to take up and relay 40 miles of 8-inch oil line near Casper, Wyoming. Collars will be cut out and all joints welded. Equipment is being moved onto the job.

50-Mile Line to Be Built From Rawlins, Wyoming

Sinclair Refining Company has awarded a contract to O. C. Whitaker Company, Fort Worth and Houston, to construct 50 miles of 8-inch pipe line from Rawlins, Wyoming, to the new field in Fremont County.

Western Refiners Request Open Discussion of Pact

Directors of the Western Petroleum Refiners Association are on record opposing the Anglo-American oil agreement in its present form and urging that before any agreement on the subject of oil is ratified, all branches of the industry be given an opportunity for a full and open discussion. The special resolution points out the agreement was drawn up "without free discussion and consideration by representatives of the petroleum industry," and that "provisions of the agreement are stated in indefinite, ambiguous and vague language, and by implication make possible, and if ratified make reasonably probable, an extension of federal control over the petroleum industry in the United States through the superimposing of powers derived from international treaties beyond those powers vested in the federal government under the constitution."

It concludes by asking the Senate not to ratify the present agreement and that before any such pact is approved that an opportunity be given for "full, frank and open discussion and recommendation, and that representatives of the industry nominated by its various branches be given a place in the formulation of any such agreement."

To Connect Wells

Kansas Power & Light Company has been granted PAW authorization to use material required to connect to seven gas wells in the Lake City gas field of Barber County, Kansas. The company will connect to a 16-inch gas transmission line using about 25,000 feet of 8-inch and 14,000 feet of 4-inch.

Line Nears Completion

O. C. Whitaker Company, Fort Worth and Houston, is nearing completion on eight miles of 10-inch crude oil loop line for the Ajax Pipe Line Company, Tulsa, near St. Charles, Missouri. Project includes a river crossing.

Big-Inch Telephones

R. W. Perkinpine, area plant supervisor of long lines department, American Telephone & Telegraph Company, St. Louis, Missouri, discussed engineering aspects of the telephone circuit arrangement provided for dispatching operations of the "Big-Inch" pipe line, at a meeting November 10 of the Tulsa section of the American Institute of Electrical Engineers.

Lines Reconditioned

O. C. Whitaker Company, Fort Worth and Houston, is reconditioning three sections of Sinclair Refining Company's Beaumont-Jacksboro, Texas, lines.

Cutting Back of Refinery Runs Causes Drafts on Inventories of Fuel Oils

Substantial drafts on stocks of both light and heavy fuel oils occurred in the week ended November 18, in response to reductions in refinery production of those products when crude runs to stills declined. Inventories of gasoline were increased, meanwhile, with benefit of somewhat larger production at refineries. Crude production was nominally greater than in the previous week, in the face of the cut-back in refinery runs, indicating there was probably no material change in crude stocks.

U. S. production of crude averaged 4,738,000 barrels daily in the week ended November 18, up 11,000 from the week before and 324,000 barrels a day or 7.3 percent more than production in the corresponding week last year. Crude runs to stills of 4,567,000 barrels daily were 83,000 a day lower than in the preceding week although 355,000 daily or 8.4 percent higher than runs in the like week a year ago. Crude stocks stood at 222,467 barrels on November 11, only about 2,000,000 barrels above the 23-year low of early September, but they probably remained unchanged or increased a little in the week ended November 18.

Production of gasoline at all U. S. refineries, including natural blended, averaged 2,083,000 barrels daily in the week ended November 18, an increase of 16,000 daily over the previous week and 300,000 barrels a day or 16.8 percent more than output in the like week last year. Stocks of finished and unfinished gasoline increased at the rate of 93,000 barrels daily, having risen to 78,741,000 barrels as of November 18. That amount was 10,252,000 barrels or 15 percent more than the 68,489,000 barrels held November 20 last year.

Gas oil and distillate fuel oil production decliend 8000 barrels daily from the previous week to 634,000 daily in the week of Novemebr 18 and was 27,000 a day or 4.1 percent lower than output in the like week a year ago. Stocks were reduced at the rate of 35,000 barrels daily and then totaled 48,017,000 barrels, but that amount was 2,720,000 barrels or 6 percent more than the 45,297,000 barrels on hand a year previously.

Residual fuel oil production of 1,260,000 barrels daily was 87,000 a day less than in the previous week and 7000 a day or ½ of 1 percent less than in the like week last year. Stocks were lowered at the rate of 100,000 barrels daily, having declined to 63,301,000 barrels. That amount was 962,000 barrels or 1.5 percent more than the 62,339,000 barrels reported for the corresponding date last year.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	[1]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 3
1943	4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	47,187	11-27	72,881	1- 2
1944	[1]4,762	9-30	[1]4,775	9-30	240,992	1- 1	89,162	4- 1	48,863	10-28	64,644	10- 7
Lows:												
1939	[2]1,601	8-26	3,125	2-18	[3]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 8
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,382	4-12	90,914	7-12
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-13	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	2-12	[4]220,623	9- 9	76,302	1- 1	30,232	4-29	49,737	3-18

TRENDS OF 1943 AND 1944

Trends in Week Ended:	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	3,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	247,219	12,813	69,297	4,642	44,591	7,968	63,833
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,409	4,359	240,251	13,427	81,085	4,054	37,266	8,889	52,857
February 26	4,423	4,377	237,137	13,183	85,248	4,558	33,766	8,952	51,387
March 25	4,385	4,443	236,285	13,362	87,287	4,979	31,319	9,013	51,669
April 1	4,383	4,435	234,667	13,824	89,162	4,450	30,530	8,367	51,326
April 29	4,431	4,300	235,342	13,126	88,462	4,284	30,236	8,398	49,985
May 27	4,514	4,532	234,423	13,502	86,468	4,702	32,035	8,568	49,812
July 1	4,587	4,638	228,860	14,052	83,559	4,496	35,360	8,872	52,235
July 29	4,608	4,627	225,112	14,115	82,665	4,833	38,135	8,900	56,280
August 26	4,667	4,698	222,931	14,112	80,740	4,566	41,453	8,680	59,839
September 30	[1]4,762	[1]4,775	222,393	14,494	78,028	4,622	45,329	9,292	64,226
October 28	4,740	4,658	223,235	14,117	79,058	4,772	48,705	8,985	64,382
November 4	4,719	4,570	222,894	14,152	78,409	4,569	48,477	8,570	63,444
November 11	4,727	4,650	222,467	14,464	78,091	4,492	48,259	9,431	63,999
Nov. 18, 1944	4,738	4,567	.....	14,579	78,741	4,436	48,017	8,824	63,301
Nov. 20, 1943	4,414	4,212	239,869	12,480	68,489	4,627	45,297	8,870	62,339
Change:									
In week	+11	—83	—427	+115	+650	—56	—242	—607	—698
In year	+324	+355	—17,402	+2,099	+10,252	—191	+2,720	—46	+962
In year	+7.3%	+8.4%	—7.2%	+16.8%	+15.0%	—4.1%	+6.0%	—0.5%	+1.5%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, November 13, 1943.

West Texas Housing Is Given Attention by FHA

In an effort to relieve the housing shortage in the Permian Basin area of West Texas and New Mexico, the National Housing Agency announces approval of houses and trailer houses in various West Texas towns, as follows:

In Kermit, contracts have been let for 120 houses, some of which are now being built; in McCamey, 25 housing units have been approved; in Levelland, 30 houses have been allotted and are being built; in Andrews, 25 units are being built and 100 trailer houses have been furnished for migratory labor.

In the Seminole area 50 trailer houses were installed about six months ago.

In the Midland-Odessa district, 183 houses have been recommended and also 72 units in the Fort Stockton area, and 25 in Crane. Hobbs, New Mexico, has 100 housing units now under construction.

☆

WALTER W. MOHR, 48, member of the engineering staff of Edward Valve & Mfg. Company, East Chicago, Ind., for 24 years, died November 13. He was chief engineer of the Edward Company for 16 years, and was the inventor of numerous types of valves, valve operating mechanisms and valve design improvements.

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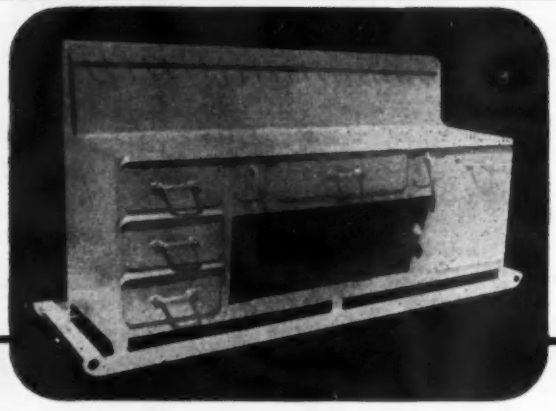

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Lucey Products Corporation has installed at its Odessa, Texas, store a complete rental department. Equipment offered for rental includes: slip elevators and slip spiders—13⅜" O.D. down; regular spiders and slips—24" O.D. down; casing and drill pipe tongs—all sizes; drill pipe slips—all sizes; casing elevators—20" down; blow-out preventors; master-gate valves; kellys—3½, 4¼ and 6"; swivels; light plants; water pumps, and numerous other items.

LUCEY PRODUCTS CORPORATION
910 Boston Avenue
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U. S. Field Operations

Oklahoma

Test in Logan County May Extend West Edmond Pool

Possibility of a 3-mile north extension to the West Edmond pool rose with the report that the Bois d'Arc section of the producing Hunton lime had been topped in Phillips Petroleum Company's Dublin 1, NE NE 18-15n-4w. Although operators declined to release tops, a report from the well, which is located in Logan County, indicated the wildcat checked normal on the Woodford.

West Edmond: Three producers were added to the pool and about a dozen inside wells were ready to complete as drilling activity was renewed after a slack week. Phillips completed Bluff 4-B, C SW NE 16-13n-4w, flowing 212 barrels of oil in three hours. Mid-Continent Petroleum Corporation washed in Lynch 3, C SE NW 18-14n-4w, flowing 155 barrels of oil in three hours, and Magnolia Petroleum Company tested 70 barrels of oil an hour and 3,400,000 feet of gas at Motter Heirs 4, C SE SW 16-14n-4w. All producers were in the Oklahoma County sector of the pool. Continental Oil Company has a third producer on its east outpost Casey lease and Phillips' Coder 1-B, C SW NE 9-14n-4w, was also testing through selective perforations. In Canadian County, Sohio et al's Robson 1, C NE NE 12-13n-5w, was bailing out at 7083 feet; Stanolind et al's Drake 2, C SE SE 13-14n-5w, was shut down for repairs at 5700 feet, and Stanolind's Drake 4, C NW NE 13-14n-5w, was drilling below surface.

Kingfisher County: Bahan Brothers, utility operators and gas producers of Guthrie, Oklahoma, have assigned a block of 4000 acres to Amerada Petroleum Corporation for $30,000 and a well, retaining shallow gas rights and the right to purchase all gas produced by Amerada. The block extends into Logan County with Amerada obligating itself to drill a Hunton lime test in the SW 31-18n-4w, on the Logan County side of the block.

Stephens County: Magnolia has a possible pool opener 4 miles northwest of the Doyle pool. Drill-stem test at its Jones 1, NW SE 21-1n-4w, at 5569-98 feet in Deese sand, recovered 1100 feet of 21-gravity oil. Merrick et al's Edward 1, SE SW SE 3-3s-5w, just north of the Loco pool, pumped 9 barrels of oil in 9 hours from sandy lime at 1163-90 feet, total depth 1405 feet.

Cleveland County: The California Company's Wilson 1, NE NE SE 27-10n-1e, Stella area, which had been closely watched as a possible Ordovician strike, was abandoned after electrolog to 6383 feet indicated a failure. Second Wilcox sand was topped at 6330 feet and the hole carried to 6390 feet. In South Moore, Barnsdall Oil Company et al abandoned Mollman 1, NE SE SE 27-10n-3w, west offset to the pool's discovery well, at 8904 feet. The failure is slightly less than a mile east of the U. S. Naval auxiliary flying field on which a bid of $2,500,000 for leasing rights was rejected by the Navy. With failures in West Moore to the west, the airfield is presumably condemned. At West Moore, Mid-Continent's Tubbs 4, NE SE SE 29-10n-3w, had Wilcox sand at 8850-79 feet, set pipe and drilled out to 8875 feet, perforated at 8856-70 feet and got a show of oil and water. It was squeezing off perforations with hopes that it would develop into a producer.

Atoka County: Northern Ordnance, Inc., abandoned Fulton Ranch 1, SE SW SW 19-1s-12w, west of Stringtown and near the Choctaw Fault trend. Final depth was 7022 feet in top of a shale identified as the Atoka. Electrolog run to bottom failed to show. This is the second failure in the county in the past two weeks.

Garfield County: After testing about 10 barrels of oil per day, Ace Gutowsky at al's Lee 1, wildcat in C SW 18-24n-5w, near Kremlin, has been temporarily shut down. It was drilled to 5937 feet, plugged back to 5400 feet where pipe was set for test.

Osage County: A. G. Oliphant et al's Osage 1, 16-25n-4e, wildcat near Fairfax, tested salt water at 4050 feet in the Arbuckle and was preparing to test a show in the Mississippi lime at 3455 feet where 1,500,000 cubic feet of gas was recovered on drill stem test.

Tillman County: The Texas Company's Asenap 1, NW NW SW 25-4s-15w, wildcat southwest of Grandfield along Red River, was rotating below 2524 feet; its Smith 1, NW NW SE 36-2s-18w, wildcat west of the Frederick pool, was drilling below 3350 feet in lime.

Missouri

Work was resumed on A. W. Waymire et al's Stubblefield 1, NW SE SW 31-37n-32w, Vernon County wildcat temporarily abandoned about two months ago at 1525 feet. Rig has been rebuilt and the well will be cleaned out, recased and deepened.

Atchison County: Nine miles east of Fairfax, Claude McQueen spudded in Meyers 1, NE SE NE 25-64n-39w, the first of 4 wildcats being drilled with a small portable rotary unit.

Jackson County: Francis et al's Liggett 1, SE SE NW 11-48n-31w, shot an oil show at 233-365 feet with 30 quarts of solidified nitro and was fishing.

Nebraska

Monebia Development Company has started up Portrey 1, NW NE 1-2n-6e, Richardson County, after temporarily

Wells Completed in United States in Week Ended November 25, 1944

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS* New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS This Week	Last Week	Cumulative This Year	Last Year
Alabama	....	....	....	....	....	....	....	....	....	....	....	....	34	2
Arizona	....	....	....	....	....	....	....	....	....	....	....	....	6	5
Arkansas	3	....	....	....	3	....	....	....	....	....	3	8	208	230
California	27	2	....	....	29	2	....	....	5	5	36	26	1,856	1,314
Colorado	....	....	....	....	....	....	....	....	....	....	....	....	26	24
Florida	....	....	....	....	....	....	....	....	....	....	....	....	3	5
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	7	4
Illinois	31	....	....	11	42	....	....	....	8	8	50	52	1,809	1,626
Indiana	....	....	....	....	....	....	....	....	....	....	....	13	313	257
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	2	3
Kansas	17	2	....	9	28	....	2	....	12	14	42	42	1,561	1,565
Kentucky	....	....	....	....	....	....	....	....	....	....	....	15	681	379
Louisiana	7	2	....	6	15	....	1	....	3	4	19	17	704	591
North Louisiana	3	....	....	2	5	....	1	....	3	4	9	6	249	278
South Louisiana	4	2	....	4	10	....	....	....	....	....	10	11	455	313
Michigan	10	3	....	....	13	....	....	....	3	3	16	....	615	535
Mississippi	4	....	....	1	5	....	....	....	....	....	5	9	187	86
Missouri	....	....	....	....	....	....	....	....	....	....	....	....	39	26
Montana	13	....	....	3	16	....	....	....	....	....	16	....	308	202
Nebraska	....	....	....	....	....	....	....	....	....	....	....	....	11	37
New Mexico	5	....	....	....	5	....	1	....	....	1	6	7	374	241
New York	10	....	15	....	25	....	....	....	....	....	25	25	1,136	1,121
Ohio	6	2	....	4	12	....	....	....	....	....	12	16	783	702
Oklahoma	25	....	1	14	40	2	....	....	4	4	46	42	1,700	1,312
Pennsylvania	27	7	15	1	50	....	....	....	....	....	50	51	2,626	2,296
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	9	6
Texas	72	6	2	27	107	....	8	....	26	34	141	124	5,561	3,831
E.Tex.Bor. Co.'s	....	....	....	....	....	....	....	....	....	....	....	....	31	18
E. Texas Field	....	....	....	....	....	....	....	....	....	....	....	....	3	5
Rest of E. Texas	....	....	....	1	1	....	....	....	2	2	3	5	258	222
North Texas	22	....	....	9	31	....	3	....	5	8	39	33	1,278	957
W. Central Tex.	3	....	1	7	11	....	2	....	5	7	18	1	382	347
West Texas	19	1	....	3	23	....	....	....	4	4	27	41	1,471	852
Tex. Panhandle	7	2	....	....	9	....	....	....	....	....	9	9	249	177
G. Coast, Upper	5	3	1	2	11	....	1	....	5	6	17	19	546	295
G. Coast, Lower	9	....	....	1	10	....	1	....	2	3	13	11	838	569
Southwest Texas	6	....	....	4	10	....	....	....	2	2	12	3	409	332
S. Central Tex.	1	....	....	....	1	....	1	....	1	2	3	2	96	57
Utah	....	....	....	....	....	....	....	....	....	....	....	....	1	....
West Virginia	1	18	....	2	21	....	....	....	....	....	21	24	864	618
Wyoming	5	....	....	1	6	....	....	....	1	1	7	....	155	110
Total U. S.	263	42	33	79	417	4	12	....	62	74	495	471	21,579	17,128

* Includes distillate wells. † Includes salt water disposal wells.

shutting down Schwang 1 at 2445 feet in the same section. L. M. Bates et al's Fritz 1, SE SE SE 34-3n-15e, 1½ miles north of Verdon, was abandoned at 2119 feet in Mississippi lime.

Hitchcock County: The Texas Company was drilling below 2440 feet in Egle 1, SE SE SW 29-4n-35w.

Indiana

Superior Oil Company's New Harmony Realty 35, wildcat in SW NE NE 17-5s-14w, Posey County, is drilling below 2785 feet. Bristol Goedde's Hackbush 1, NE NE SW 24-5s-12w, was rigging up rotary tools.

Perry County: Sun Oil Company's Gibson 1, wildcat in SE SE SE 21-1s-9w, a cable tool test, spudded in and is drilling below 128 feet.

Kansas

Test East of Hugoton Pool May Be Important Discovery

Stanolind Oil & Gas Company's Adams Ranch 1, SWc 8-35s-30w, just across the Oklahoma state line, reported nearly 100 feet of saturated Mississippi lime. The test is located about 20 miles east of the Hugoton gas pool on a 90,000-acre spread. Drill-stem test at 5861-85 feet developed 4,000,000 feet of gas. After the test, operator reported only that the well was drilling below 6215 feet. If reports of saturation are confirmed, the discovery may be among the most important of the year and will be the first commercial producer in the county.

Douglas County: J. M. Huber, Inc.'s Community 1, NWc 33-12s-20e, opened a new shallow gas area 16 miles south of the McLouth pool. Drilled to 1813 feet in the Arbuckle which was dry, it was plugged back to 698 feet, set 7-inch casing at 674 feet on Squirrel sand and after shooting with 50 quarts, tested about 500,000 cubic feet of gas with 265 pounds shut-in pressure.

Ellis County: A possible new pool loomed 3 miles south of the Bemis-Shutt field following a good oil show in H. E. Alexander's Schmeidder 1, NWc SE 28-12s-17w. Drill stem test at 3625-33 feet in Arbuckle lime showed sufficient oil to warrant setting oil string which was landed at 3629 feet and the well was preparing to test.

Ness County: Porosity and saturation was reported in Skelly Oil Company's Nuss 1, SW SE SE 15-17s-26w, but a drill stem test in Mississippi lime at 4458-62 feet recovered 145 barrels of water in 20 hours. Pipe was set at 4460 feet with the hole bottomed at 4622 feet and due to be drilled deeper after cleaning.

Brown County: Clifton Gall's Livengood 1, NE NW SW 3-1s-15e, which gave the county its first commercial production, was rigging up pumping unit for potential test. After acidizing 20 feet of saturated Hunton lime topped at 2578 feet, the discovery swabbed about 300 barrels of clean oil in 15 hours. Total depth is 2591 feet with oil testing 26.5 gravity.

☆

CHARLIE KIMBALL has joined Louisiana Supply Company, Sulphur, Louisiana as sales representative in Southwest Louisiana.

Rocky Mountain Area

Carbon County, Montana, Wildcat Shows Saturation

General Petroleum Corporation's Peters 1, wildcat test of the Clarks Fork Structure in C NW NW 25-9s-22e, approximately 5 miles northwest of the Elk Basin field, Carbon County, Montana, drilled into the second Frontier at 6450 feet. On drill stem test at 6461-90 feet, open 30 minutes, the well recovered 2430 feet of gas-cut mud and a showing of oil.

A previous test of this section was unsuccessful because the packer failed to hold. The well was drilled to 6531 feet and 7-inch casing will be run before operations are suspended for the winter.

Dry Creek: Sinclair-Wyoming Oil Company's State 1 in NE NW SW 27-6n-3w, Dry Creek structure in Fremont County, Wyoming, drilled into steeply dipping beds and has been abandoned at 4191 feet. Cores taken near bottom showed dips of 50 degrees. Due to an overthrust, the well drilled into the Sundance at 2203 feet and back into the Nugget at 2685 feet. The well later drilled back into the Sundance and at 3960 feet picked up the Nugget again. It is believed rotary tools will be moved from this location to Sinclair Oil Company's wildcat test, Donovan 1, on the Dubois structure, in NE NE NE of 11-42n-107w, Sublette County.

North Cole Creek: General Petroleum Corporation is grading location for Government 78 in NE SE NE of 8-35n-77w, north of the Cole Creek field, Natrona County, Wyoming.

Sheldon Dome: Carter-Kerlyn's Shoshone 1 in NE NE NE of 16-5n-2w, deep test of Sheldon Dome in Fremont County, Wyoming, drilled to 5722 feet when a break in the butane hose to the stove on the derrick floor started a fire which destroyed the rotary rig and derrick.

Illinois Basin

New Producing Horizon Found in Mattoon Area

Oil prospects in the Mattoon area, long gloomy because of dozens of unsuccessful tests on each side of the city, brightened when a new producing horizon was discovered.

The horizon is the Cypress sand, located by Carroll and Burgett's Ruby 3, 24-12n-7e, northernmost well in the Mattoon pool. Pay was recovered at 1830-50 feet and after a 40-quart shot the well was cleaning out with 800 feet of oil in the hole. The well may make the best producer in the pool, which is yielding oil from Rosiclare and Aux Vases.

Other operations in the pool: Anthony Keating's Uphoff 3, SW SE SW 24-12n-7e, is rigging rotary tools; Beckman's Harris-Rudy 1, C NE 26-12n-7e, is waiting on cement for test of Aux Vases sand at 1965-80 feet; Beckman's Harris-Rudy 2, SE NE NE 26-12n-7e, is drilling below 1750 feet.

Hamilton County: Sinclair Wyoming Oil Company's Russell 1, SW SE SW 17-7s-7e, 6 miles southwest of the Rural Hills pool, may make 1000 barrels of oil daily when completed in the Aux Vases sand. During a drill-stem test of pay at 3130-50 feet, the well made gas in 5 minutes and recovered a hole full of oil in an hour. Operators were waiting on cement with pipe set at 3190 feet.

Jasper County: The Pure Oil Company has an apparent pool opener at Dhom 1, SW SW SE 34-7n-10e, 2 miles northeast of Boos production. The well swabbed 54 barrels of oil in 5 hours from McClosky lime at 2665-70 feet and is still testing.

Edwards County: The Albion pool has an extension ½ mile west of the south end of the pool at Illinois Mid-Continent Petroleum Company's Hodgson 1, NE SW NE 11-3s-10e. Well swabbed 86 barrels in 11 hours from Biehl sand at 2020-30 feet and was still testing.

Wayne County: Pure's White 1, SW NW SE 6-1n-9e, 3 miles northwest of Mt. Erie, a wildcat test, has been abandoned at 3237 feet.

Lawrence County: Cherry and Kidd's Gray Trustee 1, NE NE SW 19-3n-12w, prospective pool opener 3 miles southwest of Bridgeport and 1½ miles from nearest production, pumped 3 barrels of oil per hour from Rosiclare at 2044-48 feet after 3000 gallons of acid. Hole is bottomed at 2105 feet.

Kentucky

W. F. Lacey and others' Williams 1, 4-Q-20, 7½ miles north of the Uniontown field, is showing for a discovery in the Aux Vases sand at 2600-05 feet. During a 30-minute drill-stem test, the well made 100 feet of oil. Operators are running casing.

New Mexico

West Extension Sector of South Lovington Expanded

The Texas Company's State 1-A-H, C NE NW 8-17s-36e, expanded the west extension sector of the South Lovington field, Lea County, ⅝ mile southwest, with natural potential of 433 barrels through tubing choke from broken San Andres lime at 4780-5160 feet. This is the eighth consecutive flowing producer for the area, which was uncovered last June by Fred Turner, Jr., and associates, and it is rated the most important regular-pay strike for the state this year.

Nine rigs are in service. The Texas Company is starting State 2-A-H, ½ mile west of its extension well. The Texas-New Mexico Pipe Line Company is handling the oil for the account of the Sinclair Refining Company.

Humble Oil & Refining Company's Leonard-Federal 1, recent Ellenburger discovery for the Dublin area, Southeastern Lea County, has apparently exhausted water that has been showing with the 49-gravity oil, and gauged 189 barrels daily on 3/32-inch choke. Production is from perforations at 11,890-11,928 feet. The compnay's second Ellenburger project will be ¾ mile to the southeast. Humble Oil & Refining Company's Keinath-Federal 1, C SE NW 8-21s-38e, near the east border of Lea County, was drilling limey-shale at 9360 feet on Ellenburger objective.

Continental Oil Company et al's Skaggs 2-B-23, between the Monument

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and Skaggs fields, proved dry on drill stem test of perforations between 10,000 and 10,086 feet in Simpson, and will perforate higher with best prospects for production from the 7700-foot Permian. This wildcat entered granite at 10,430 feet without reaching the Ellenburger.

☆

H. H. FRANKS, 73, former president of Franks Manufacturing Company, died November 17 in Tulsa. He came to Tulsa in 1909 with Hinderliter Tool Company and later was associated with Murray Tool Company and Tide Water Associated Oil Company as head of the repair department. In partnership with Carl White, Jr., he organized his own company in 1930 and retired last March. He helped to develop the portable drilling rig and other mobile oil field units.

West Texas

Ector County Test Prepares To Run Pipe at 10,181 Feet

Shell Oil Company and Cities Service Oil Company's T. P. Land Trust 1, Western Ector County, 3⅞ miles northeast of the Wheeler-Ellenburger field, was conditioning hole to run pipe at 10,181 feet in Ellenburger, topped at 9980 feet, being 802 feet high to nearest Ellenburger producer, after encountering a prolific head of sulphur water.

This wildcat had previously confirmed oil production from the Lower Permian, Devonian and Silurian, thereby making it an outstanding Ellenburger prospect. Samples of the top section of Ellenburger showed evidence of dead oil. Six tests, including 2 drilling, have been authorized for the area, while lease obligations require the starting of 4 more tests before April 1. The Texas Company's T. P. Land Trust 1-B, 4 miles southeast and on a 160-acre lease that requires production by December 15, was drilling shaley-lime at 7295 feet with a good chance of making the Devonian before the deadline.

Permian Strikes: Leland Fikes and John Murchison's Alexander 1, near C NW NW PSL 18, Block K, Terry County wildcat, filled 800 feet with oil from broken saturation at 5108-57 feet in San Andres, topped at 4400 feet with elevation of 3554 feet. It is 136 feet high to a failure 2 miles to the southwest and 146 feet high to a failure 2½ miles northeast. In Southern Cochran County, Honolulu Oil Corporation's Hudson 1-9, 3 miles southwest of the Slaughter field, was making swabbing test at 5136 feet for water shutoff after plugging back from 5153 feet. A commercial well is in prospect from the San Andres saturation, topped at 5070 feet with elevation of 3709 feet, being within the production contour of nearest Slaughter field wells.

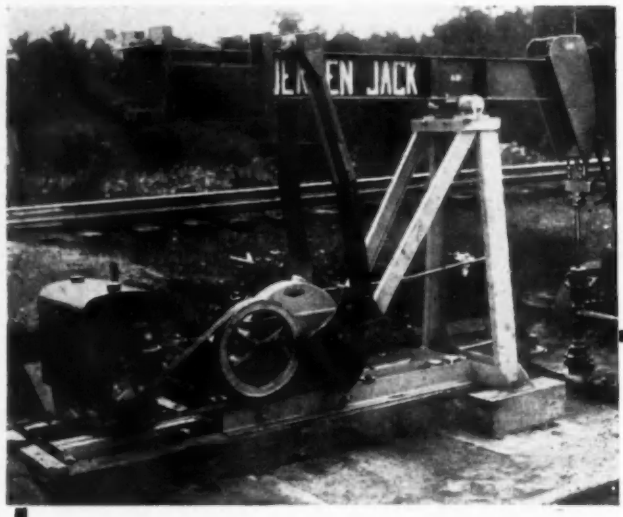
Hockley County: The Texas Company's Montgomery 1, 7 miles north of the Slaughter field, added further confirmation of its favorable structural position in bailing 1 gallon of oil hourly at 4780 feet, and was fishing for bit at 4820 feet. This wildcat logged first gas show in the San Andres at 4751-60 feet with an increase at 4790-94 feet, using cable tools.

Andrews County: Magnolia Petroleum Company's University 1-11, a mile southeast of most easterly well in Fullerton field, revived production outlook for considerable high-priced acreage in swabbing and flowing 141 barrels on 15-hour test from broken Clear Fork pay at 6910-6996 feet, having set packer at latter depth to exclude water at 7044 feet. Drilling has been resumed to try for Silurian production. The company's Ralph 1-A, a mile west of the field, was drilling lime at 7245 feet. It is to explore the Ellenburger.

Gaines County: Shell Oil Company's Sparks 1, 12 miles southwest of Seminole field, halted at 10,604 feet in unidentified lime, and will run 5½-inch casing near botton to perforate opposite several prospective pay zones.

Winkler County: Sun Oil Company's Keystone 2, 2 miles north by west of Keystone-Ellenburger area and more than 1000 feet low, entered the Waddell, or Basal Simpson, sand at 10,085 feet, carrying good oil odor and stain in cuttings, but drill stem tests were unsuccessful. Test was drilling at 10,145 feet to explore the Ellenburger before landing pipe. Richardson & Bass, Inc.'s Kansas City 1, 2¾ miles southeast of the field's nearest Ellenburger well, and 1½ miles southeast of nearest Holt lime production, entered the San Angelo at 5040 feet, 402 feet low, and logged oil stain and odor at 5684-98 feet.

Upton County: Humble Oil & Refining Company's Parrott 1, 14 miles northwest of the Big Lake field, was conditioning hole at 7750 feet in shale to run 7⅝-inch casing after loosening stuck pipe. This wildcat passed up prospective oil production at 7537-99 feet, and is due to continue to the Ellenburger. Standard Oil Company of Texas' McElroy 1, 6 miles east of the McElroy field, recovered 1380 feet of gas-cut mud when tester was used at 6376-6448 feet, and



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was drilling shale at 6555 feet. Magnolia Petroleum Company's American Republics 1, near the north line of the county, was drilling shale at 7515 feet without shows.

Ordovician Tests: Magnolia Petroleum Company's Foster 22, Iatan-East Howard field and fourth Ellenburger test for Mitchell County, resumed coring at 8455 feet, having recovered drilling fluid without shows in making 3 drill-stem tests since entering the Ellenburger at 8415 feet. In Pecos County, the company's Hart-State 1, 2 miles southwest of the Abell field, resumed coring after proving dry on drill stem test at 6455-78 feet. Humble Oil & Refining Company's State National Bank 1, 6 miles southeast of the Heiner pool, where production occurs more than 300 feet below top of the Ellenburger, entered the Ellenburger at 8245 feet, and was drilling dry dolomite at 8430 feet.

North Texas

New Deep Oil Strike from Bend Made in Clay County

Clay County is assured of a new deep oil strike through Anderson & Prichard Oil Corporation's Wood 1-A, Section 12, MEP&P Ry survey, 7 miles south by west of Petrolia. The well flowed oil on 11-minute drill stem test of conglomerate at 5937-45 feet in Bend, topped at 5884 feet.

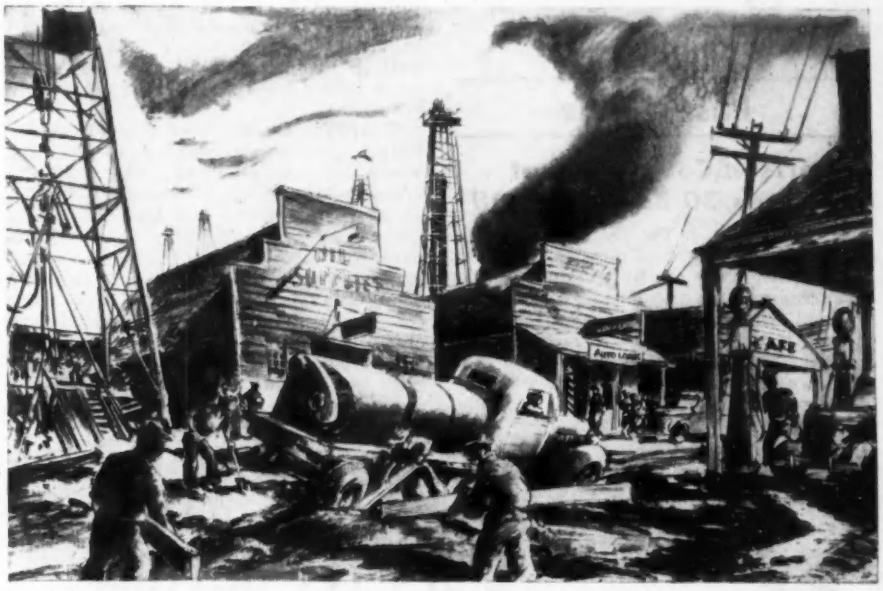
The prospect was drilling limey-shale at 6010 feet to explore the Simpson and Ellenburger before running pipe for completion. The Bend marker is 59 feet high to Franklin Drilling Company's Staggs 1, 3¾ miles east, a failure that passed up nominal shows of oil and gas in the Bend, then entered the Simpson and Ellenburger at 6410 feet and 6645 feet, respectively. Wood 1-A is 4 miles southwest of the Petrolie shallow gas field, where granite is reached near the 2500-foot level.

Foard County: The Texas Company's Bell 1, Abb Luce survey and a 6000-foot project, logged oil saturation in conglomerate at 5384-5415 feet, and was due to make drill stem test. This wildcat tested 710 feet of salt water with 1800 pounds bottom-hole pressure in 10 minutes in porous zone at 5240-5318 feet.

Wichita County: Panhandle Refining Company and James Stewart Construction Company's Madden 3, 1350 feet southeast of their Madden 1-well pool, flowed 360 barrels of oil on 6-hour test through ½-inch choke with gas-oil ratio of 990/1, after using 1000 gallons of acid through perforations at 5072-92 feet in Bend, topped at 5072 feet, or 9 feet low. Their discovery was a marginal pumper from the 4300-foot Strawn after plugging back from barren Ellenburger at 5304-51 feet without testing the upper Bend, although perforations at 5165-78 feet yielded 10 barrels oil and 100 barrels water. The Texas Company's First National Company-Kemp & Allen 27, 3-1/3 miles northeast of nearest Ellenburger production in the K-M-A field, flowed 48 barrels initial through choke after 70-quart nitro shot in Ellenburger at 4114-50 feet, having deepened from the 3800-foot Strawn. It probably involves a separate Ellenburger high.

Wilbarger County: Fain & McGaha's Sumner 1, east offset to their Odell pool discovery, entered the Palo Pinto lime

PIONEERS ★ ★ ★ *from a lithograph*



BOOM TOWN — *By E. M. Schiwetz*

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saturation at 4778 feet, 31 feet low, and bottomed in pay at 4804 feet to cement pipe at 4768 feet for completion. Three additional tests are under way to the west and south of the discovery.

East Texas

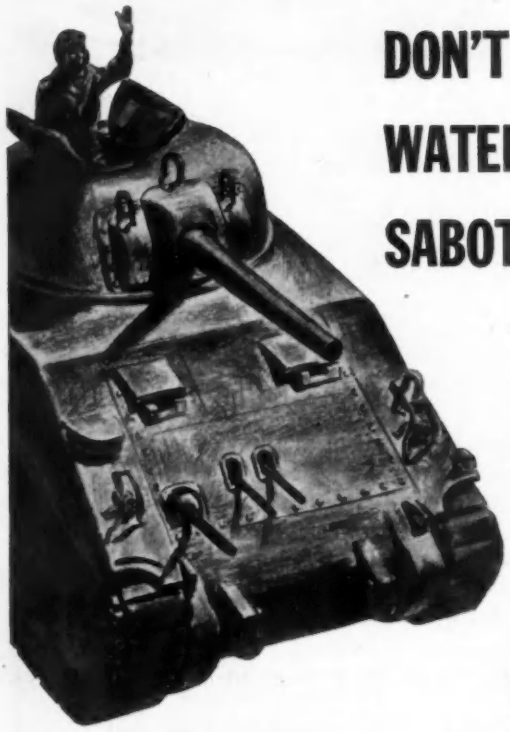
Robertson County Offset Averages 30 Barrels of Oil

Hamman Oil & Refining Company's Gibson 2, northeast offset to its recent shallow discovery for Robertson County, is averaging 30 barrels of oil with a nominal amount of brackish water daily on pump from Basal Navarro sand at 2242 feet.

This confirmation test failed to indicate production prior to being given a pumping test. The firm's Gibson 1, first commercial well for the county and 5½ miles west by south of Calvert, has not been given a completion test, but is pumping 47 barrels of 35-gravity oil daily from sand at 2181-94 feet. A southwest offset to the discovery is under way.

Cherokee County: Humble Oil & Refining Company's Stanley 1, 3700 feet south by east of its Larissa pool discovery, was fishing at 10,521 feet in Pettit, which is 90 feet low and apparently barren. The Travis Peak will be explored before running pipe, as an oil producer is considered possible from the 8500-foot Glen Rose, where drill stem test returned free oil. William H. Foster et al are concluding negotiations for a work-over job on their Bowling 1, Lone Star pool deep test that may make a pumper from the 8300-foot Rodessa.

Oil wins wars!



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Hopkins County: Sun Oil Company's Turner 1, 2 miles northeast of the recent Picton pool strike, was drilling dry paluxy at 6580 feet, having entered the Fort Worth lime at 8795 feet, being flat with the Bacon (Rodessa) lime discovery. Two tests are starting between this outpost and the producer.

Henderson County: Lone Star Producing Company's Lee 1, B. C. Walters Survey and 2½ miles north of Athens, was drilling at 8385 feet to explore the Pettit and Travis Peak. This wildcat temporarily passed up possible production in a thin zone of Bacon (Rodessa) saturation at 8208 feet, where drill stem test yielded 270 feet of 48-gravity oil and 125 feet of salt water.

Shelby County: Humble Oil & Refining Company's Pickering Lumber Company 1, S. Francois Survey A-207, is drilling at 4546 feet in shale and lime. Cores taken from 3515-34 feet recovered shale with no porosity; another core from 3534-48 feet recovered 14 feet of shale with no shows.

Rogers Lacy's C. A. Hyden 1, D. T. F. Yordt Survey, ran 10¾-inch casing at 1000 feet and is waiting on cement.

Harrison County: Stanolind Oil & Gas Company and Continental Oil Company were preparing to take a core at 5963 feet, total depth, in the upper Rodessa series at J. S. Harris 1, T. Gray Survey 3 miles southeast of Woodlawn. After passing the base of Massive at 5582 feet, operators drilled soft lime with odor of oil and gas from 5703-06 feet. A core from 5706-11 feet obtained 3 feet of porous lime with no showing. A drill stem test at 5691-5711 feet with tool open 49 minutes, using ¼-inch chokes top and bottom, recovered 110 feet of drilling mud with distillate odor.

Angelina County: Humble's Angelina Lumber Company 1, W. H. Herring Survey, is drilling at 4683 feet in shale. Perforations made at 1737-39 feet have been squeezed.

Bowie County: Al M. Sutton's wildcat has spudded in and set 10-inch casing at 358 feet. It is a Smackover lime test in the center of Block 5, Jessie Davis Survey, 500 feet from an old test abandoned by Joe Burnham and associates which logged oil shows, though not in commercial quantities.

J. K. Hughes et al may abandon J. R. Howard 1, J. H. Dyer Survey, 15 miles north of DeKalb. The well has encountered no showings to present depth of 4940 feet in shale.

Southwest Texas

New Shallower Sand Found In West Sinton Field

Tide Water Associated Oil Company has found a shallower sand in its new West Sinton field, San Patricio County, with P. E. Dyer 1, ¼ mile southeast of the discovery. The well perforated casing at 1046-52 feet after plugging back from 3480 feet. On original test it produced 22 barrels net oil in 24 hours, flowing through a ⅛-inch choke with tubing pressure 220 pounds and casing pressure 315 pounds. However, it made 25 percent salt water and 15 percent basic sediment along with the oil, and died during the second day. It will set up pumping unit and complete as a small pumper at this point. The discovery well in this area produced from approximately 3400 feet.

Goliad County: Amerada Petroleum Corporation's Ada G. McFadden 1, expected to open a new producing area 12 miles west of the town of Goliad, is still making preparations for the next test after having failed mechanically to get a successful test at 8483-8499 feet. The test had started showing some pressure and recovered part of the water cushion when the packer failed. It cemented all perforations, and was drilling retainers and cement plug, preparing to perforate at 8932-42 feet for a production test.

Amerada's McFadden 2, new test in the same area, has spudded and is drilling below 1619 feet in shale and shells, but is being slowed down by shortage of water. The water well is being reworked.

Amerada's Waitschies 1, another wildcat west of Goliad, and in the E. J. Armstrong Survey, is standing after the test at 5420-34 feet where it showed tubing pressure of 100 pounds and casing pressure 70 pounds, and has been closed in and drilling rig moved off. It may move in a workover rig to complete testing. Total depth of this well was 13,267 feet.

Jim Hogg County: Earl H. Smith's R. H. & Ella McCampbell 1 will be a 4750-foot wildcat test 12 miles south of Hebbronville, in Sec. 13, Rankin & Fowler subdivision, Blk. 35, Las Uinoritas Survey.

Location has been made for a wildcat 2 miles south of the Henne-Winch-Farris field, Texon Royalty Company and Drilling & Production Company's Vela 1, in the northeast corner of Survey 108. M. L. Massingill is contractor and will take the well to 2850 feet.

Jim Wells County: H. M. Naylor Oil Company has made a location on the west side of the Bentonville field for Bird 2, 990 feet south of Bird 1, testing with total depth 5497 feet and expected to produce from one of several sands.

Starr County: Sun Oil Company's J. G. de Garza 1, wildcat north of the Sun field, is preparing to complete after having made a drill stem test at 5607-25 feet. Using ¼-inch chokes, and open 15 minutes during the test, the operators recovered 1930 feet of clean oil with working pressure of 135 pounds.

Texas Gulf Coast

Conroe Field Wilcox Test Slated to Resume Coring

George W. Strake's P. G. Krohn W-1, important Wilcox test in the Conroe field, was drilling at 10,396 feet, scheduled to resume coring at 10,450 feet. This well is still reported running structurally high on the lower formations, having reached the sand section equivalent to the Lake Creek pays below 9400 feet. Cores are being analyzed. Electric logging survey to 10,000 feet, showed considerable sand throughout the section, although generally they are more broken than sand at Lake Creek.

Wharton County: General Crude Oil Company's Security Bank & Trust Company 2, which is opening a new producing area north of the Magnet field, Lane City area, has reset screen and was preparing for another production test. A late test, with casing perforated at 5345-50 feet, showed the well flowing 26.1-gravity pipe line oil at the rate of 4 barrels per hour through a 5/32-inch choke with tubing pressure 300 pounds and casing sealed. Production is from the Frio formation.

Colorado County: Tide Water Associated Oil Company's D. L. Underwood 1, which opens a new field in the western edge of Colorado County, is waiting on cement after squeezing to repair a split in the casing at 5240-42 feet. On the production test with casing perforated at 9517-21 feet, the well started flowing wash water and crude oil through a ¼-inch choke with casing pressure 300 pounds and tubing pressure 50 pounds, but started making salt water and finally went to salt water almost completely. Water intrusion was thought due to a bad cement job and the perforations were being squeezed when the split casing was discovered.

Harris County: F. M. Corzelius' Meineke 1, wild gasser which has been out of control in the Bammel field for 18 months, was finally killed and has been cemented up at the bottom. The well was recently taken over by H. M. Harrell, who was paid $150,000 by Corzelius, and final efforts to control the well were under supervision of Railroad Commission engineers.

In the Spring area, northern part of the county, Glenn McCarthy is building roads to his Edward E. Lemm 1, new test south of the town of Spring and more than a mile south of the lone producer in the Spring field.

Tyler County: American Republics Corporation & Houston Oil Company's J. S. & Wm. Rice 1, southwest of Spurger, has been abandoned after recovering salt water on each of two tests in the 5000-foot sand. The 5½-inch casing had been set at 5307 feet after the

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well drilled to 8295 feet and failed to find showings in the Wilcox. Casing was perforated at 5050-55 feet and a drill stem test showed water. Casing was then perforated at 5045-48 feet for a test which also showed water and no oil.

Hardin County: Sun Oil Company's Merchants Estate 1, in the Sour Lake area, is making production test with casing perforated at 6335-65 feet, and is opening a new producing area. During the last 20½ hours of the 24-hour test, flowing through a ½-inch choke, it made 67 barrels of oil with tubing pressure 100 pounds. While flowing 3½ hours through a ¼-inch choke, it had made 18 barrels of oil with tubing pressure 175 pounds.

Liberty County: Gulf Oil Corporation was preparing to drill a test in the Hankamer field to 11,500 feet. Location will be 660 feet northeast of Gulf's Crow & Jacobs 6, in H&TC Survey 5.

South Louisiana

Only Nine New Tests Begun In Week of Declining Work

A general decline in new work during the past week resulted in only nine new tests. Only wildcat staked was Union Sulphur Company's B. T. Wait 1, 18-9s-6w, southeasterly flank of the old Iowa dome, Jeff Davis Parish.

Iberia Parish: Humble Oil & Refining Company's Petit Anse B-2, 23-13s-5e, Avery Island, in a new sand at 9500 feet, registered 75,000 cubic feet of dry gas per day and a small quantity of oil on latest drill-stem test from perforations at 8954-64 feet. Operators are planning to reperforate for another test.

Iberville Parish: Humble's Robinson 1, 91-10s-13e, Laurel Ridge, was plugged back to 10,635 feet, perforated, and flowed at a rate of 72.09 barrels of condensate and 2,650,000 cubic feet of gas daily on ¼-inch choke.

St. Charles Parish: The Pure Oil Company's GATX 2, 7-12s-8e, southwest of the No. 1 discovery at Good Hope, is waiting on cement with 7-inch casing set on bottom, total depth 7878 feet. In the same area, Humble is moving in rig for Sarpy Bros. 1, 7-12s-8e.

St. Martin Parish: Phillips Petroleum Company's Bob 1, 28-8s-7e, is drilling below 9700 feet. Gulf Refining Company's St. Martin 2-D, at Hager, was drilling at 10,079 feet in shale, and Stanolind Oil and Gas Company's Iowa-St. Martin 1, also at Hager, was preparing to drill at 10,437 feet in shale.

Jefferson Parish: The California Company's E. P. Brady et al 1, 2-16s-23e, deep wildcat test is drilling below 11,035 feet.

Steps Taken Looking to Raising Minimum Wages

Preliminary steps toward raising the level of minimum wages were taken last week by a special Senate education and labor subcommittee headed by Senator Claude Pepper of Florida, author of a bill instructing the War Labor Board to establish a standard minimum of 65 cents per hour.

The subcommittee held hearings on the bill November 17 and 18, at which it was given the support of strong labor groups.

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North Louisiana

New Oil Field Is First For Richland Parish

A new oil field was discovered, the first for Richland Parish and a new oil producing zone, the Cotton Valley, was announced for the Haynesville field of Claiborne Parish. The field has produced almost 100,000,000 barrels of oil since its development 23 years ago and still yields 10,000 barrels per day.

Potential millions were added to its reserve with the discovery of oil production at Ohio Oil Company-Gulf Refining Company's G. W. Taylor 1, C SW¼ 15-23n-8w. The well is producing 337.2 barrels of light green 43.8-gravity crude per day. Volume of gas was 403,000 cubic feet, gas-oil ratio 1068/1. Production test was made through a 16/36-inch test, with casing pressure of 1850 pounds and tubing pressure of 90 pounds. The well was perforated with 60 shots from 8910-20 feet and with 240 shots from 8835-75 feet. It is not certain from which level production is being obtained. Other perforations have not been squeezed off at lower levels, ranging from 9545-70 feet to 10,310-23 feet. These lower perforations have made 3 to 4 barrels of distillate and about 500,000 cubic feet of gas. Operators will be required to squeeze perforations and test the two upper levels to decide production.

Taylor 1 is a rework job, originally drilled to 11,274 feet and plugged 5 years ago. Pettit production was discovered in the Haynesville field in 1941, and the well was recompleted as a 5400-foot producer. The Pettit was squeezed off, when operators decided to test other show areas, and cleaned to original depth. Gas-distillate production was also indicated from tests at 10,525-553 feet.

Richland Parish: Existence of an oil field in the Delhi area has been proved by C. H. Murphy, Jr.'s J. E. Holt 1, 21-17n-9e. The well entered the Tuscaloosa section at 3205 feet, found solid sand showing oil at 3273 feet and drilled to total depth of 3278 feet. Two 5-foot cores taken from 3277-78 feet obtained only partial recovery of saturated oil and gas sand. An 11-minute drill stem test from 3267-87 feet recovered 2000 feet of 38-gravity oil, with no formation water. Shut in pressure is 130 pounds. Casing has been ordered run to complete the well. It is believed that the test found a pinch-out against the Monroe uplift.

Derrick has been completed for Roeser-Pendleton and Atlas Oil & Refining Corporation's Tensas Delta Land Company 1, C SW SW 1-14n-5e, scheduled as a Tuscaloosa deep wildcat test on a 15,000-acre block owned jointly by these firms.

Red River Parish: The Texas Company's Semp Russ 1, 16-12n-10w, 4 miles west of Coushatta, will open a dry gas field if salt water encroachment can be eliminated from the Travis Peak section perforated with 90 shots opposite 7146-64 feet. A drill stem test with packer at 7099 feet recorded a flow of 3,500,000 cubic feet of gas per day through ¼-inch positive choke on bottom and adjustable choke on gas heater. After 5 hours flow, pressure was stabilized at 1820 pounds. The well began making 5 barrels of salt water per hour and was closed in with orders to squeeze perforations. Production was dry gas testing .585-gravity,

and estimates of open flow were as much as 10,000,000 feet a day. Total depth of hole is 7186 feet with 7-inch casing cemented at 7137 feet. Possibility of Pettit production was indicated by a blow and some distillate on a previous drill stem test at 5010-33 feet.

Magnolia Petroleum Company's J. C. Pickett 1, C SE SE 11-14n-10w, another deep wildcat, was drilling at 1600 feet in shale.

Jackson Parish: Shell Oil Company was nearing contract depth of 8000 feet in Tremont Lumber Company 1, C NW SE 22-15n-1w, wildcat 3 miles south of Chatham. Shell plans to suspend operations at contract depth and move in company rig to test deeper horizons.

The Texas Company is building derrick for Tremont Lumber Company 1, C NE NE SW 6-16n-1e, scheduled deep wildcat in the extreme eastern part of the Parish.

Concordia Parish: The California Company is running string of 9⅝-inch protective casing at 9175 feet before resuming drilling of Applegate 7, 14-9n-10e, a wildcat which will go to 13,000 feet. No indications of commercial shows have been reported.

Caldwell Parish: Placid Oil Company is clearing location for Louisiana Central Lumber Company 1, C SE NW 16-11n-3e, between the Lowe and Standard gas fields. Rig will be moved in this week.

Lincoln Parish: Big West Drilling Company's N. B. Gill Estate 1, C NW SE 35-20n-2w, is drilling below 5695 feet with no shows of oil or gas. Cores taken from 5234-54 and 5405-25 feet revealed sand carrying salt water.

Arkansas

Promising Union Wildcat Is Awaiting Equipment

Root Petroleum Company is still awaiting pumping equipment for a test at Union Saw Mill 1, C NW NW 27-18s-12w, wildcat which has indicated production from Smackover lime in the Strong area, Union County. The well swabbed 3½ barrels of pipe line oil per hour from 24 perforations opposite the lime at 6319-29 feet. It is 26 miles from nearest Smackover production in the Snow Hill field north and west, and 33 miles from Smackover production east at Schuler field.

Marine Oil Company's Thompson B-1, SE SE NE 10-18s-13w, old well in the Urbana field, is being deepened to the Smackover. Electrical survey was run at 4975 feet, which indicated top of Cotton Valley sand at 4075 feet, and drilling was resumed. The well is drilling below 5300 feet without commercial showings. Location is 6 miles northwest of Root's Union Saw Mill 1.

Phillips Petroleum Company's Callie 1, 30-18s-12w, Strong area, is still reported in the Cotton Valley section and is shut down for orders at 5008 feet while correlating electrical survey which logged sand stringers with possible showing of oil.

Kerlyn Oil Company ran electrical survey and is correlating Crossett Lumber Company, C SW SW NW 9-19s-10w, Felsentha section of the county. No shows have been obtained, and the well may be carried deeper. Kerlyn has spudded with machine to set surface casing at Church 1, SW SW SE 22-19s-11w, projected 4000-foot wildcat.

Root Petroleum Company is drilling below 800 feet in McRae 1, C SW SE 16-16s-18w, third Smackover lime test in Union County.

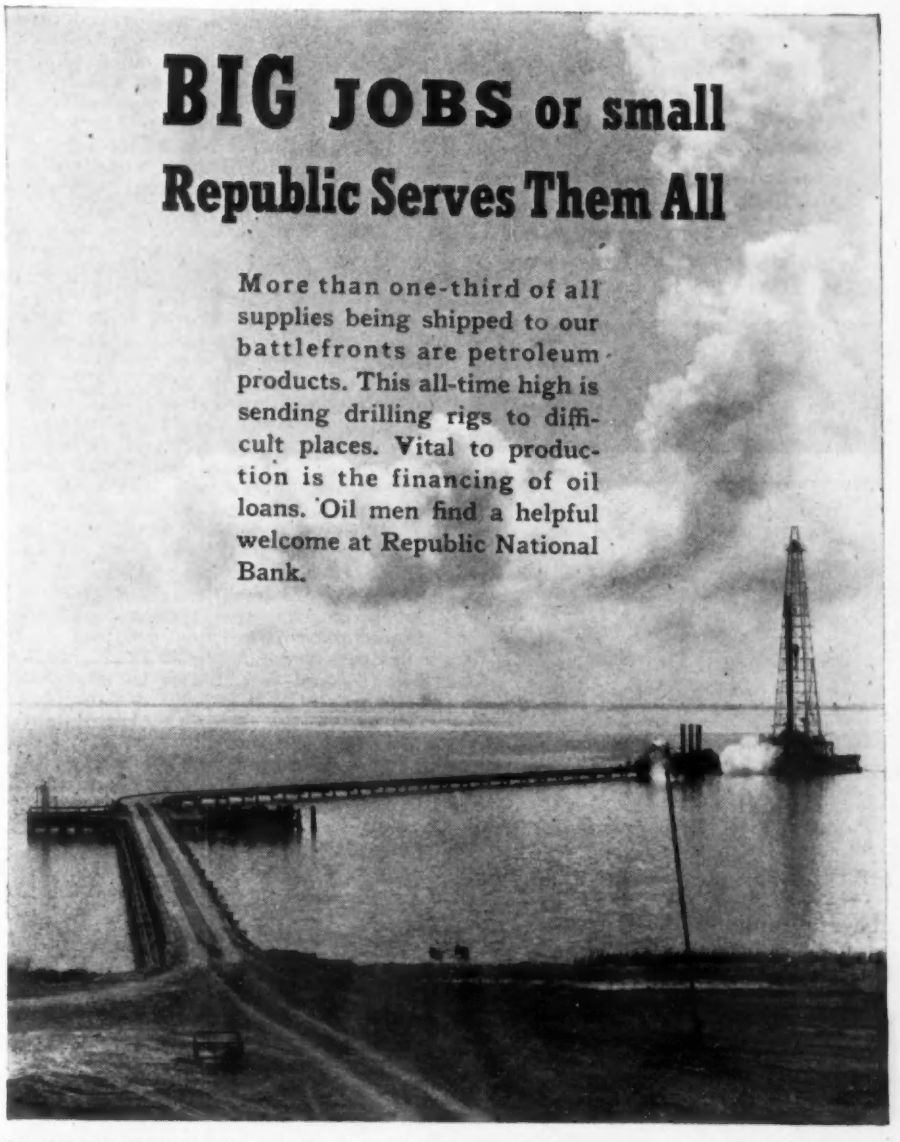
Lafayette County: Barnsdall Oil Company has staked a Smackover lime test in the McKamie field, Moore-McClendon 1, 100 feet east of C NE 34-17s-24w, west edge of the field. It may extend production ½ mile. Well data will reveal whether a connection exists between McKamie and the Patton pool, 2½ miles west. If the two fields are producing from the same reservoir, a spacing problem will arise. Patton field, which has only 2 producers, has been developed on a 40-acre pattern.

Pope County: Stanolind Oil & Gas Company's G. B. Maxwell 1, C SE SE 18-8n-18w, is at 4175 feet and preparing to run 8⅝-inch casing before resuming drilling with cable tools. No shows have been indicated in this test or in the Arkansas-Louisiana Gas Company's S. M. Hudson 1, 15-10n-24w, another cable tool test, and the deepest well yet drilled in the Clarksville gas field, Johnson County. The Hudson 1 is straight-reaming at 6138 feet, and will go to the Arbuckle lime when drilling is resumed.

Ashley County: Lion Oil Refining Company's Betty 1, C NE NE 29-17s-4w, is drilling below 200 feet. It is 5 miles north of Parkdale on a lease of 4000 acres.

☆

E. M. ALLEN, West Texas-New Mexico division manager for the Shell Oil Company with headquarters at Midland, has terminated 25 years of service to move to Tulsa.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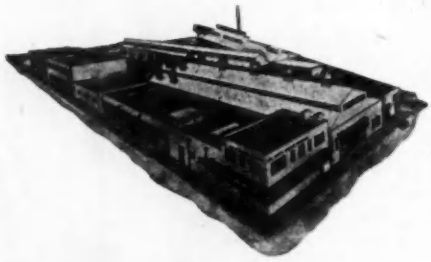

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Trading Post Section
ON PAGE 83 OF THIS ISSUE

Southeastern

Five Mississippi Wildcats Are Staked During Week

Five wildcats were staked during the week in Mississippi. Warren Petroleum Corporation and Roeser-Pendleton will try for Tuscaloosa production in J. V. Johnson 1, C SE SE 9-6n-14w, the Sanford area, Covington County, 33 miles southeast from nearest production in the Gwinville field.

Roy Fisher and F. R. Jackson spudded in Huddleston Heirs 1, 9-10n-10w, in an attempt to extend the Heidelberg field in Jasper County. The test is 1½ miles south and ¼ mile west of Kingwood Oil Company's Hill 1, most southerly producer in the field. Wanete Oil Company and R. B. Lack et al staked Frederick & Beadles 1, C SW NE 32-7n-14e, as a deep test 3 miles north and 12 miles west of Meridian in Lauderdale County on a gravity meter prospect. The Carter Oil Company has located A. B. Mansell 1, C NE SE 36-11n-3e, 4 miles southeast of production in the Pickens field. Gulf Refining Company staked location for O. P. Foley 1, C SE NW 8-10n-13w, in the extreme southeastern corner of Smith County on the flank of the New Home Dome discovered by its Dykes 1, 5-10n-13w.

Clarke County: Kirby Petroleum Company is drilling below 4540 feet in shale in the Eutaw sand at Long Bell Petroleum Company 1, NW NW SW 30-1n-18e, wildcat test that has picked up some shows of oil. Base of Chalk was logged at 3646 feet and 14 feet of sand heavily saturated with black oil at 3649-63 feet. A 30-minute drill stem test recovered 10 feet of drilling mud with no showing of oil. Below the sand the well encountered a 10-foot shale break from 3662-72 feet, and solid sand showing oil at 3572 feet, though no commercial production was indicated. Closest production to the new prospect is 6 miles east and 1 south at H. L. Hunt's Robert Land 2, Choctaw County, Alabama. Both the Kirby test and the Hunt well are northwest of the Hachetigbee anticline, which lies in Choctaw, Clarke and Washington Counties, Alabama.

Lamar County: Gulf Refining Company recorded a flow of 203 barrels of 15.9-gravity oil during a 9-hour test through ¼-inch tubing choke at C. V. Cooper 1, C NE NW 7-1n-16w, discovery well of the new Baxterville field. Gas volume was 4000 cubic feet per hour, considerably less than in earlier tests, which indicated a high gas-oil ratio. The test was made from a new series of 60 perforations in the upper section of the solid Massive opposite 8734-44 feet and from original 144 perforations in the broken sand of the Massive at 8690-8714 feet. The well has logged an unusually thick section of pay ranging from 8723-8839 feet, and also has other possibilities of production further up the hole as indicated by drill stem tests taken during drilling. The well will be completed in existing perforations, however, at total depth of 9080 feet.

Sinclair Wyoming Oil Company's Newman Lumber Company 3, C NE SW 5-5n-16w, is drilling at 7664 feet in shale. The well will go to 10,000 feet if necessary.

Jefferson Davis County: Gulf Refining Company logged gas and oil bearing sand in cores from 9233-46 feet in D. L. Mullins 1, C NW NE 34-9n-19w, 2½ miles southwest of the Gwinville field. Hole was reamed down to 9220 feet, a 25-minute drill stem test at 9230-46 feet, using ¼-inch top and bottom chokes and a 1200-foot water cushion was made but results have not been ascertained.

Superior Oil Company of California's Willie Burr 1, NW NE SW 19-9n-18w, a mile east of the Gwinville strike, is drilling below 7942 feet.

Adams County: The Pure Oil Company is reported to have logged 40 feet of oil sand below the Massive zone in J. M. McDowell, 12-6n-3w, and is drilling below 11,619 feet in shale.

Pearl River County: Sinclair Wyoming Oil Company is drilling below 5053 feet in shale and lime at R. Batson 1, 20-1s-15w, Massive Tuscaloosa test, but has found no indication of oil.

Hassie Hunt, Trustee is rigging up rotary at R. Batson 1, C NE SW 10-1s-14w, which will seek production from deep horizons and should reveal interesting geological data.

Florida

Florida wildcats on the active list were drilling but none were at testing stages. One failure was reported: Hunt Oil Company abandoned J. W. Gibson 3, 18-2s-11e, in Madison County, below 3466 feet.

In Collier County, Sunniland area, Humble Oil & Refining Company's Gulf Coast Realties 4, 20-48s-30e, wildcat deep test, was reaming hole at 1500 feet in lime, after cementing 13⅜-inch casing at 1448 feet. Humble's State 1, C NE NW 30-55s-36e, in Dade County, is drilling in anhydrite below 8381 feet. The Pure Oil Company is drilling below 7711 feet in C. C. Hopkins 1, C SW NE 21-6s-9e, Gulf County. Stanolind Oil & Gas Company's St. Joe Paper Company A-1, NW C NE NE 15-2s-2e, is drilling below 6630 feet.

Alabama

The Hunt Oil Company's M. W. Smith Lumber Company 1, C NE SW 11-10n-4w, wildcat southwest of production in the Gilbertown field of Choctaw County, is drilling below 3320 feet. This is the only active wildcat in Alabama. Another is waiting on pump to test and two are shut down.

Georgia

Georgia's only active wildcat, The California Company's Brunswick Peninsula 1, Land Lot 7, Wayne County, is drilling below 2610 feet, after setting 7-inch pipe at 2535 feet.

Michigan

Arenac County Field Has Farthest North Producer

Rowmor and Teater's State 1, SW NE NW 14-19n-3e, Arenac County, flowed 140 barrels per hour from a Dundee dolomite top pay at 3850 feet. It is the farthest north producer in the North Adams pool and is offset 660 feet south and west by dry holes. The field now has been extended a mile north of the original pool developed in 1941.

Ervin Major's Lesny 2, NW SW SE 9-19n-4e, off the southeast end of the Deep River field, was estimated at a

1500-barrel daily potential from Dundee dolomite to open development in previously questionable territory.

Mecosta County: Michigan consolidated Gas Company completed Evans 1, NW SE SW 12-15n-8w, Martiny Township, for 610,000 feet of gas in the Stray sand at 1391 feet.

Montcalm County: After cementing off a Monroe pay and redrilling in an attempt to reduce the oil/water ratio on initial test, Gordon Oil Company's Paris 1, SE NW NW 6-12n-8w, Cato Township, flowed 20 barrels of oil and 70 barrels of water simultaneously to leave the wildcat's commercial status questionable. Production is from 3548-50 feet.

Wexford County: Teater and Americrude's Wexford 1, NE SE NW 1-21n-9w, wildcat test, was shut down for orders at 3908 feet, 72 feet in the Dundee objective horizon. Operators probably will deepen to test the Upper Monroe.

California

Olcese and Vedder Sands Missing In Kern Test

The British-American Oil Producing Company - Capital Company's Portals 43, 3-30-29, 660 feet west of the Race Track Hill field discovery well in Kern County, drilled into Granite at 5533 feet and is testing upper showings by stages. The productive Olcese sand logged in the first well and the Vedder sand were absent.

Certified production rate of California petroleum liquids for December is 937,000 barrels daily, of which 885,000 barrels daily are crude oil production and 52,000 barrels natural gasoline and condensate. Rates are practically unchanged from November.

Fresno County: Seaboard Oil Company's Seaboard-Superior Oil Company 5-5, 5-17-15, northwest of the Raisin City field, found intermediate gray sand in the thin Miocene sand section and was abandoned after a drill stem test at 6231-6234 feet recovered 1800 feet of salt water. The Eocene sands were also wet.

Shell Oil Company's Edison-Securities 25, 22-13-16, has cemented 5½-inch casing at 5780 feet and will gun-perforate and test. On a drill stem test at 5773-5780 feet, the well flowed 8,000,000 cubic feet of gas and 400 barrels per day of salt water.

Kern County: Shell's K.C.L.-B 45-27, 27-30-26, on a test at 8110-8160 feet, open 58 minutes, recovered 182 feet of gassy oil and 1713 feet of gas-cut mud.

The Superior Oil Company's Houghton 38-25, 35-29-26, Bellevue field, was completed with a flow of 157 barrels per day, 34.9-gravity, 0.4 cut oil and 80,000 cubic feet of gas. Production is through an 8/64-inch bean from perforated intervals at 6823-08 feet and 6794-6804 feet.

Los Angeles County: R. E. Havenstrite, Operator's Liebhart 2, Del Valle field, on a drill stem test at 7951-8017 feet flowed at a 400-barrel per day rate and 15,000,000 cubic feet of gas. Correlations indicate a new production zone.

Ventura County: Los Nietos Company's L.B.H. 1, 22-3-21, southwest of the South Mountain field, was drilling at 4265 feet. A drill stem test at 4200-4244 feet recovered 30 feet of oily mud.

Canadian Wildcat Seeking Maritime Area Production

Three wildcat tests in the maritime provinces of eastern Canada are seeking production in the Lower Mississippian Horton series from which oil is produced in the Stoney Creek field, south of Moncton, New Brunswick.

Socony-Vacuum Oil Company-Cities Service Oil Company's Hillsboro 1 in Hillsboro Bay, Prince Edward Island, was drilling below 11,000 feet in mid-November, and has logged non-marine Pennsylvanian sandstones and shales all the way down. Up to 3000 feet of Upper Mississippian marine and non-marine strata are presumed to be present between the basal Pennsylvanian and the deep lying Horton beds. It remains to be seen whether the hole can be carried to that depth. Penetration to the Ainsley Sand objective is likely to require drilling beyond the present world depth record.

Lion Oil Refining Company's Mary 1, west coast slope of Cape Breton Island, was drilling at 4740 feet on November 7 in salt and shale streaks, probably near the base of the Upper Mississippian Windsor series. No Pennsylvanian section occurs on Cape Breton Island.

In Hants County, central Nova Scotia, the locally financed Nova Scotia Oil and Gas Company has started the most recent test in the basin area. Using cable tools, this company plans to drill several wells to 4000 feet or more along the strike trend of the Mississippian strata on the south rim of the basin, searching for stratigraphic traps in the Horton series corresponding to the one in which the Stoney Creek oil occurs.

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Otis (Jack) Pyles, Service Engineer
2210 Leopard St.,
Corpus Christi, Texas
Phone: 5078

Gulf Coast-Central Texas District
Fred A. Turner, Service Engineer
2701 Clinton Drive
Houston, Texas
Phones: Day Fairfax 5346; Night L-1265

Southeast Texas-Louisiana-Mississippi Gulf Coast
A. S. (Andy) Herron, Service Engineer
1108 3rd St.,
Lake Charles, La.
Phone: 4677

North East Texas-Northern Louisiana-Northern Mississippi and Arkansas District
W. H. Ward, Service Engineer
417 Lake Street
Shreveport, La.
Phone: 2-6273

Tri-States and Michigan District
C. B. Holder, Service Engineer
Box 493, Mt. Vernon, Ill.
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Eastern District
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64 Wilkins St.,
Hudson, Mass.
Phones: Day 67-W; Night 134-M

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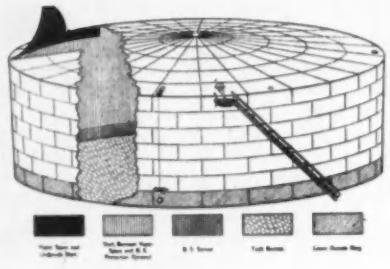

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WESTERN CANADA

$250,000 Drilling Program Begun in Calgary Foothills

A quarter of a million dollar program, involving drilling to at least 9000 feet in the foothills southwest of Calgary, has been opened by nine leading Alberta independent oil companies, which will seek oil on the "Priddis-Black Diamond" Anticline, east of the Turner Valley oilfield.

The structure, also known as Calling Valley, will be tested at a site 2 miles east of the well (Royalite-New Valley 1) now being drilled by Royalite Oil — Standard Oil Company (New Jersey) — to determine prospects of the New Valley anticline, presumed to be a fold between North Turner Valley and the Priddis-Black diamond structure.

The program, to be carried out through Calling Valley Oils Ltd., is backed by: Commonwealth Petroleum, Commoil, Ltd., Command Oils, Commonwealth Drilling Company, Ace Royalties, Ltd., Gas & Oil Products, Ltd., Spooner Oils, Model Oils, and McDougall-Segur Exploration.

Calling Valley 1 has been staked in lsd 6 24-21-3w5th, with spudding slated the end of this month. Heavy duty rotary is being used.

Geologist Joseph S. Irwin, who reported on the company's 14,800 acres, believes the Madison limestone objective will be found around 8600 feet. The site is along the indicated crest of the structure.

Continuing to keep four light rotaries engaged on the Southern Alberta plains, California Standard has staked two wells to replace the recently completed Birdsholm and Eureka dry holes.

First new site is Crow-Indian Lake-Province 2, in lsd 1 20-4-14w4th, about 11 miles southeast of the Conrad-Province 2, Ellis sand discovery well. Second new site is the Legend-Province 3, in lsd 13 23-7-13w4th, 7 miles northwest of the Legend Railway point, and 7 miles southeast of the Eureka-Province 1 dry hole.

Surplus Lubricating Oils To Be Sold by Government

The Reconstruction Finance Corporation has on hand for sale surplus lubricating oils and greases which cost the government $193,047, it was reported November 17 by Secretary of Commerce Jones.

These supplies are scattered among 15 of the RFC's regional agencies, with the largest quantity, $79,828 worth, at Seattle. To October 31, the report showed lubricating oils and greases costing the government $371 had been sold for $323.

Other industry products held by the RFC for disposal included $978 worth of gases, including liquefied petroleum gases; $18 worth of gasoline and liquid hydrocarbon components, $38,937 worth of naphtha, solvents and other petroleum finished light products, $185 worth of kerosene, and $412 worth of fuel oils. In addition to the lubricating oils and greases, the only products sold so far have been naphtha, etc., of which $275 worth was sold for $259.

The RFC also has on hand $14,926 worth of petroleum refinery machinery and equipment, about evenly divided between New York and New Orleans, and $773,119 worth of well and blast hole drilling machinery, all at Los Angeles.

U. S. Exploratory Completions

CALIFORNIA WILDCATS

Fresno County—Failures: General Pet. Corp.'s Burrel 8-26, se se 26-16-18, Kreyenhagen 7320 ft, Courtney 7635 ft, Domengine 7764 ft, Wheatville 7867 ft, sands wet, abnd 7923 ft.

Seaboard Oil Co.'s Seaboard-Superior 5-5, nw sw 5-15-17, Tested wet 6231-34 ft, abnd 6447 ft.

Kern County—Failures: Richfield Oil Corp.'s King 1, ne sw 31-30-30, Granite 1504 ft, abnd 1566 ft.

Bender Drlg. Co.'s 20-1, ne se 20-27-28, Vedder 2090 ft, Lower Vedder 2295 ft, abnd 2306 ft.

General Pet. Corp.'s Larkins 2, se ne 10-28-28, Vedder 2747 ft, abnd 2765 ft.

ILLINOIS WILDCATS

Bond County—Failure: Northern Ordnance's Champion 1, ne ne sw 9-6n-3w, abnd 642 ft.

Clinton County—Failure: Joe May et al's Carlyle Park Comm. 1, nw nw nw 31-2n-2w, abnd 1246 ft.

Edwards County—Failure: Superior's Cowling 1, se sw ne 21-1s-14w, abnd 3079 ft.

Effingham County—Failure: H. Sherman et al's Niemerg 1, sw sw sw 16-7n-7e, abnd 2810 ft.

Hamilton County—Failure: Magnolia's Haas 1, nw nw sw 16-4s-6e, abnd 3552 ft.

Jasper County—Failure: Pure's Arnold 1-B, ne ne ne 14-6n-10e, abnd 2808 ft.

Madison County—Failure: Joe Kesl's Whittmore Hrs. 1, sw sw 25-5n-6w, abnd 2025 ft.

Wayne County—Failure: Sinclair Wyoming's Milner 1, nw ne ne 31-1n-6e, abnd 3314 ft.

KANSAS WILDCATS

Barber County—Failure: J. M. Huber's Buck 1, sw ne sw 35-30s-14w, abnd 4684 ft.

Barton County — Failure: Bridgeport Oil's Liebl 1, nw nw 16-18s-11w, Lans 3071 ft, abnd 3094 ft.

Butler County—Failure: Marlyn et al's Doyle 1, se se nw 22-29s-5e, Miss 2383 ft, abnd 2841 ft.

Graham County — Oil Discovery: Skelly's Davis 1, nwc 15-7s-22w, pump 518 bbls 39.2-gr, perf 41 shots, 1600 gals acid 3518-41 ft Lans, td 3854 ft, pb 3522 ft.

Graham County — Failure: Sunray's Dunwoody 1, sec sw 2-8s-22w, Lans 3328 ft, Arb 3690 ft, abnd 3731 ft.

Greenwood County—Failures: J. E. Morris et al's Fisher 1, 31-24s-10e, Miss 2294 ft, abnd 2385 ft.

Producers Supply Co.'s Maes 1, sec nw 2-27s-9e, Miss 2265 ft, Arb 2634 ft, abnd 2640 ft.

McPherson County—Failure: Reynolds et al's Goering 1, nw se nw 27-21s-2w, abnd 3527 ft.

McPherson County—Oil Discovery: Williams & Morine's Henne 1, swc 4-17s-1w, pump 75 bbls, Miss 2618-45 ft, td 2645 ft.

Reno County—Failure: S. Noble's Voth 1, ne sw se 7-22s-4w, Arb 3973 ft, abnd 4003 ft.

Russell County—Failure: Maguire Industries' Brundage 1, se ne nw 10-12s-15w, abnd 3200 ft.

Saline County—Failure: Don Ingling's Wilson 1, nwc sw 12-16s-1w, Miss 2636 ft, abnd 2662 ft.

Stafford County — Failure: Cities Service's Jenkins 1-B, swc se 4-25s-13w, abnd 3640 ft.

Trego County—Failure: T. H. Allen's Monroe 1, swc 8-11s-21s, Arb 3800 ft, abnd 3855 ft.

NORTH LOUISIANA WILDCATS

Bienville Parish—Failure: G. H. Pierce-R. H. Crow's E. W. Merritt 2, 13-17n-7w, abnd 3690 ft.

Catahoula Parish—Failure: Sinclair Prairie's Gabe Fisher 1, c ne nw 26-9n-6e, abnd 5814 ft.

Grant Parish—Failure: Calapor Mfg. Co.'s Edenborn 1, 20-7n-3w, abnd 4538 ft.

Lincoln Parish—Distillate Discovery: California Co.'s Jessie Mae Norris 1, c nw ne 15-18n-1w, elev 181 ft, perf 119 shots 9060-80 ft, flow 8.11 bbls 57.2-gr in 2 hrs, ¼-in choke, 2,235,000 gas per day, gor 23,041/1, td 9768 ft.

MICHIGAN WILDCATS

Allegan County—Failure: J. E. Hood's DeFouw 1, sw sw se 17-4n-15w, Traverse 1462 ft, abnd 2175 ft.

Gladwin County—Failure: W. L. McClanahan's Roman 1, n½ nw se 15-19n-1e, abnd 3541 ft.

Osceola County—Failure: Gordon Oil Co.'s Lakies 1, se se sw 15-20n-9w, Dundee 4002 ft, Monroe 4080 ft, abnd 4118 ft.

NEW MEXICO WILDCAT

Eddy County—Oil Discovery: P. B. English et al's Hinkle 1, (OWDD) c ne ne 22-19s-31e, elev 3536 ft, deepened fr 2551 ft, where temp

abnd, pump 15 bbls Yates 2370-2435 ft, shot 40 qts nitro 2370-85 ft, td 2599 ft, pb 2435 ft.

OKLAHOMA WILDCATS

Garvin County—Failures: Sinclair Prairie's Wright 1, se sw ne 20-3n-3e, abnd 2291 ft.
E. J. Kubat's Newburn 1, ne ne sw 18-4n-2e, Bro 4098 ft, abnd 4130 ft.
Greer County—Failure: E. K. McLennen's McLeod 1, sw nw nw 32-6n-21w, abnd 668 ft.
Logan County—Failure: Fox & Fox's Tontz 1, ne ne 32-17n-3w, 1st Wx 6294 ft, 2nd Wx 6376 ft, abnd 6478 ft.

WEST TEXAS WILDCATS

Brewster County—Failure: M. L. Hopson et al's Fee 1, 200 ft out nwc D&W sec 113, blk G-1, show oil 1286 ft, abnd 1560 ft.
Gaines County—Failure: Amerada's Jones 1, 2 sw sw PSL 59, blk AX, elev 3589 ft, anhydrite 2070 ft, San Andres 4500 ft, abnd 7838 ft.
Howard County — Failure: J. B. Hawley-Northern Ordnance's Spaulding 1, 1648 ft snl 1651 ft ewl T&P Ry. 7, blk 33, T-2-N, elev 2651 ft, San Andres 3198 ft, Wichita-Albany 5075 ft, Cisco (Pennsylvanian) 5995 ft, abnd 7202 ft.
Yoakum County — Failure: Honolulu's McLane-T. P. Coal & Oil Co. 1, c nw nw sec 324, blk D, J. H. Gibson sur, elev 3595 ft, anhydrite 2450 ft, brown lime 4200 ft, San Andres 4570 ft, abnd 5428 ft.

WEST CENTRAL TEXAS WILDCATS

Brown County—Failure: M. L. Cordua and S. M. Messer's Boyd 1, 500 ft snl 4100 ft wel of Thomas Pratt sur No. 107, abnd 1320 ft.
Eastland County—Failure: Wm. S. Kelly et al's Yeager 1, 990 ft nsl 900 ft ewl nw sec 5, BBB&C Ry. sur, abnd 491 ft.
Jones Coutnty—Failure: M. M. Travis et al's McDuff 1, sw se ne sec 28, Orphan Asylum Lands, elev 1708 ft, abnd 2446 ft.
Shackelford County — Oil Discovery: Fortex Oil Corp. et al's G. Smalley 2, 1960 ft nsl 1700 ft ewl E.T. Ry. 13, blk 10, elev 1361 ft, pump 12 bbls Fry sd 631-34 ft, td 635 ft.
Shackelford County—Failures: E. L. Elliott, agent's City of Albany Lake 1, 660 ft wel 1682 ft snl ne T&P Ry. 10, blk 11, abnd 1181 ft.
Jones-Stasney et al's Sheppard 1, 1650 ft nsl 1980 ft ewl sec 18, Bayland Orphans Lands, elev 1290 ft, abnd 453 ft.
Taylor County—Oil Discovery: Great Lakes Carbon Corp.'s W. E. Jones 1, 330 ft nsl 2942 ft wel of Wm. Bishop sur No. 43, 5¼ mi nw Lake Kirby pool, elev 1775 ft, pump 35 bbls oil, 20 bbls wtr, 4000 gals acid Flippen lime 2005-34 ft, td 2508 ft, pb 2034 ft.

SOUTH CENTRAL TEXAS WILDCATS

Atascosa County—Failure: Harry S. Stahl's Mary Ann Suggs 1, 1000 fr nl 1000 fr wl 180-ac tr 1000 fr wly wl 700 fr wl Simon Fisk sur 1171, abnd 1003 ft.
Milam County — Oil Discovery: C. Padger Reed's A. L. Lucas et ux 1, 1994 ne of c swl th nw at ra 330 to len in 380-ac lse, T. J. Chambers 2-Lee Gr, near Minerva field, pump 5 bbls, td 1393 ft.

SOUTHWEST TEXAS WILDCATS

Webb County—Failure: O. W. Killam's E. Garcia Heirs 3, 1400 fr el sur 609 1600 w nw of No. 2 on same 640-ac lse, McLean 3185 ft, abnd 2260 ft.
Zapata County—Failure: Bridwell Oil Co.'s Maria T. G. Garcia et al 1, 1640 fr nwl 9143 fr swl 2211-ac lse, Charco Redondo Gr, Sh A, abnd 1816 ft.

LOWER TEXAS COAST WILDCATS

Goliad County — Failure: Barnsdall's Alvin Metz et al 1, 467 fr nw&swl 292-ac lse swl being Manahuilla Crk, sw and cond 7949-56 ft, abnd 8515 ft.
Jim Wells County — Failure: Blanco Oil-Al Buchanan's Eureka College 1, 467 fr s&wl blk 3 40-ac lse, Los Olmos and Loma Blanca Ignacia de la Pena Gr A-345, abnd 6868 ft.

LOWER TEXAS COAST NEW PAY TEST

Refugio County—Bonnie View Oil Discovery: P. R. Rutherford-Royal O&G Co.'s Henry Schirmer 1, 467 fr s&wl 160-ac lse 467 fr n&wl ne¼ sect 25, 7 mi s Woodsboro, elev 26 ft, sand 4564 ft, perf 12 shots 4579-81 ft, flow 125 bbls 22.7gr, ¼-in, gor 201/1, td 4582 ft.

TEXAS GULF COAST WILDCATS

Chambers County—Failure: Sinclair Prairie's G. R. Bauer 1, 660 fr s&el T&NO sur A-502, sect 79, 4 mi nw Winnie, abnd 9619 ft.
Jefferson County—Oil Discovery: Humble's Jefferson Land Co. C-1, 466 fr el 467 fr sl Shelby Corizine sur A-14 on blk 7 nw flk 3600 ft of nearest 7700-ft sd well, N. Lovell Lake area, elev 13 ft, sand 7175 ft, perf 22 shots 7175-80 ft, flow 86.5 bbls 28.9-gr, ¾-in, gor 4440/1, td 9983 ft.
Liberty County—Failure: Phillips' Joe and Mary Ardoin et al 1, 990 fr wl 330 fr nl sect 8 HT&B sur A-960, 4 mi se Felicia, abnd 8750 ft.
San Jacinto County—Failure: Albert Plummer's W. J. Settegast Heirs 1, 2800 nw of m/sly/sel 330 fr swl 1240-ac lse, James Hurt sur A-161, abnd 9038 ft.
Tyler County—Failure: American Republics Corp.-Houston Oil Co. of Texas' J. S. and Wm. Rice 1, 660 n of m/nly/l 660 w of m/ely/el BBB&C sur 9, 7½ mi se Hillister, abnd 8295 ft.

EAST TEXAS WILDCATS

Hunt County — Failure: Hollandsworth Dr.

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■ One Cardwell Model R, Double Drum Spudder; One Fort Worth Jumbo C spudder. Tools complete and steel dog houses for both. Call 3846 or write Lesh Drilling Company, 210 South Main Street, Henderson, Kentucky.

■ FOR SALE: One light second-hand drilling rig, 4500 ft. 4 in. pipe with tool joints; two 125 HP boilers; located in North Central Texas. Address: Box 34, c/o The Oil Weekly, Houston, Texas.

■ FOR SALE: 1—7000 ft. Power Rig with Lee C. Moore Cantilever Derrick (Good rig for Miss.), 2—4000 ft. Power rigs with Lee C. Moore Cantilever Derricks. 1618 Maury Street, Houston, Texas. F-2904.

■ FOR SALE: 35,000 ft. 8⅝" OD 21.31 lb. L.W. Line Pipe in 40-ft. Lengths P.E. Beveled Used, but in excellent condition. UTILITY & INDUSTRIAL SUPPLY COMPANY, 921 E. Michigan Ave., Jackson, Michigan.

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1—Steel Tool House on Steel Substructure.
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1—7½" KW Light Plant with Waukesha Motor on Skids.
1—250 Barrel Bolted Steel Water Tank.
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7500' 4½ OD Pittsburgh Seamless Drill Pipe w/ Hughes Counterbore Joints. All necessary tools to complete a rotary rig.
Rig in operation until approximately November 27, 1944.

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1—18" Wilson-Snyder High Pressure Steam Slush Pump.
1—20" Gardner Denver High Pressure Steam Slush Pump.
1—Emsco Type A 36"—5 Sheave 1⅛" Travelling Block.
1—Oilwell 66" x 36"—5 Sheave 1⅛" Travelling Block.
1—44"—4 Sheave 1⅛" Emsco Crown Block.
1—6" 150 Ton Gumbo Buster Swivel.
2—6" Ideal Type G.S. Swivels.
2—4" Ideal Type G.S. Swivels.
1—McNeely Shale Shaker, complete overhauled, Motor Driven.
1—Link Belt Shale Shaker, completely overhauled, Steam Driven.
1—12 x 12 Oilwell Horizontal Twin Piston Valve Type Steam Engine.
1—27½" Type FE Union Tool Rotary.
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2—Emsco Type D 25½" Rotaries.
2—Oilwell 17" Junior Make and Break Rotaries.
400—8-V-Thread, Grade C Casing Couplings.
All sizes BJ Break Out Tongs, Casings, Tubing Elevators, Tubing Slips and Bowls.
1—30" 3000 Watt Delco Automatic Gasoline Light Plant.
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■ Chemical Engineer to engage in research and development work with major oil company along crude oil producing lines. Would include some field work. Recent graduates of interest. Position offers good future. Give full personal data, experience, and salary desired. Our employees know of this advertisement. All answers strictly confidential. Address: Box 30, c/o The Oil Weekly, Houston, Texas.

■ Research Geophysicist with several years experience preferably including field work and laboratory work, to engage in research geophysics with major oil company. In charge of work including evaluation of new ideas and experimental development of same. Position offers good future. Give full personal data, experience and salary desired. Our employees know of this advertisement. All answers strictly confidential. Address: Box 28, c/o The Oil Weekly, Houston, Texas.

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■ Gulf Coast District Geologist for expanding independent oil company. Should have wide acquaintance among major companies and be able to do some trading. Position offers good future. Give full personal data, experience, references, and salary desired. Address: Box 35, c/o The Oil Weekly, Houston, Texas.

NOTICES

■ CAPITAL SEEKERS—Interested in raising $25,000 or more for a postwar project should writer to AMSTER LEONARD, Fox Bldg., Detroit 1, Mich.

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■ Gravity Meter Survey Service, with or without Seismographic shooting. Make contracts now for early 1945 season. Address: Box 32, c/o The Oil Weekly, Houston, Texas.

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■ Man 58 years old, very active and in good health, with 11 years experience in supervising Gas Lift installations, being familiar with practically all standard gas lift equipment. Utilizing that equipment that you may have on hand and making it perform satisfactorily. Address: Onie Moore, Beeville, Texas.

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Co.-Stanolind's Kimbell 2, 180 ft fr m/e/el 1675 ft fr m/e/sl 309½-ac tr, James Cole sur, 1069 ft se of old failure, elev 587 ft, Pecan 1340-85 ft, Gober 2035 ft, Comanche lime 3580-3610 ft, abnd 4507 ft.

Wood County — Failure: Sinclair Prairie's Collins 1, 660 ft out nwc 111-ac tr, 1500 ft wel 5500 ft nsl M. Rentarez sur A-481, elev 494 ft, Midway 1560 ft, Pecan 3226 ft, Austin 4815 ft, Woodbine 5570-80 ft Georgetown 6405 ft base Ft. Worth 7410 ft top Goodland 7910 ft Paluxy 7989 ft abnd 8271 ft.

NORTH TEXAS WILDCATS

Archer County—Oil Discoveries: J. W. Carter et al's W. H. Taylor 1, 1850 ft nsl 630 ft ewl of John Smith sur A-377, or blk 458, Geraldine Townsite Survey, elev 1047 ft, pump 24 bbls oil, 4 bbls wtr, sand 1611-15 ft.

White & Duncan's J. T. Richardson 1-C, 939 ft wel 1890 ft snl blk 10, Jonathan Scott sur A-374, elev 1152 ft, pump 9½ bbls, sand 1216-29 ft.

Archer County—Failure: H. M. Kelleher et al's Abercrombie 1, 1150 ft ewl 894 ft nsl Wm. Cound sur A-798, abnd 1390 ft.

Clay County—West Ross Discovery: Fain & McGaha's O. A. Ross 1, 430 ft wel 1800 ft snl BBB&C Ry. sec 7, A-49, ⅞-mi sw Ross fld, separated by low failure, elev 917 ft, Bend 5402 ft, Ellenburger 5648 ft, flow 822 bbls 43-gr, ½-in choke, gor 750/1, 3000 gals acid Bend conglomerate perf 5395-5435 ft, td 5664 ft, pb 5640 ft.

Clay County—Failure: Continental's Welch 1, 330 ft out nwc blk 26, Freestone CSL, elev 1080 ft, Barnett 6354 ft, Viola 6595 ft, Simpson lime 6602 ft, Simpson dolomite 6614 ft, Ellenburger 6765 ft, abnd 6810 ft.

Hardeman County—Failure: Amerada's Conley 1, c se ne W.&N. Ry. 89, blk H, elev 1472 ft, Canyon 5223 ft, abnd 5880 ft.

Haskell County — Failure: Humble's J. D. Hughes 1, 660 ft out sec H&TC Ry. 4, blk 14, elev 1609 ft, abnd 5121 ft.

Young County—Failure: Standard of Texas-Hanlon & Buchanan's Dent 1, lse 2, 467 ft nsl 1400 ft wel TE&L Co. sec 2387, elev 1221 ft, Bend 3753 ft, Mississippi (Chester) 4561 ft, Chappel 4585 ft, abnd 4740 ft.

WYOMING WILDCAT

Fremont County—Failure: Sinclair Wyoming's State 1, ne nw sw 27-6n-3w, Dry Creek structure, 50° dips in Nugget, top 2685 ft, abnd 4191 ft.

United States Wildcat Starts

ALABAMA

Choctaw County: Hunt Oil Co.'s M. W. Smith Lbr. Co. 1, c ne sw 11-10n-4w, bldg dk.

Wilcox County: Southern Nat. Gas Co.'s Fannie Stokes 1, c sw nw 32-12n-5e, lcn 6500-ft test.

ARKANSAS

Union County: Kerlyn Oil Co.'s Church 1, sw sw se 22-19s-11w, lcn 4000-ft test.

CALIFORNIA

Kern County: Shell's KCL 1, nw nw 24-29-27, Fruitvale area, lcn.

Superior's Moor 2, nw ne 16-29-21, Cymric area, dr 1250 ft.

Aga Oil Co.'s SP 10, sw ne 3-27-28, Mt. Poso area, dr 1210 ft.

General Pet. Corp.'s Schaller 1, se se 10-28-28, Rd. Mountain area, lcn.

Reserve Oil & Gas Co.'s 33-8, se ne 33-11-19, Tejon Ranch area, lcn.

Kings County: Shell's Crow 41-2, nw ne 2-23-16, lcn.

COLORADO

Larimer County: Ft. Collins Prod. Corp.'s Woods-Windsor Reservoir 1, c sw ne 18-8n-68w, north flk Ft. Collins fld, dr 1314 ft.

ILLINOIS

Bond County: H. Luttrell et al's Ulmet 1, se nw sw 8-4n-3w, lcn.

Clay County: Sinclair Wyoming's Haupt 1, sw se nw 5-2n-6e, lcn.

Clinton County: Al Schiermann et al's Jonsen 2, sw nw ne 32-2n-2w, dr 344 ft.

Jefferson County: Sinclair Wyoming's Hones 1, nw sw ne 21-3s-4e, lcn.

Marion County: Ohio's Spongler 1, se se nw 1-1n-3e, lcn.

Montgomery County: Magnolia's Prater Est. 1, nw nw nw 31-7n-2w, lcn.

Richland County: Fulk & Cravens' Saegar 1, se se se 7-3n-9e, lcn.

Texas Co.'s Wright 1, ne sw nw 24-4n-10e, lcn.

KANSAS

Barber County: Huber et al's Mauch 1, sw nw ne 8-31s-10w, lcn.

Ellis County: Max Cohen's Madden 1, nwc ne 4-13s-17w, dr 56 ft.

Maguire Industries' Stecklein 1, sec nw 21-14s-17w, mim.

Nemaha County: Fred D. Culpepper et al's Lamparter 1, sw se 3-2s-14e, lcn.

Phillips County: Skelly's Thayer 1, sec ne 34-5s-19w, lcn.

Rooks County: Helmerich & Payne's Ordway 1, sec 21-10s-18w, dr 274 ft.

Stafford County: Lion Oil's Gamer 1, nw sw sw 17-25s-13w, lcn.

NORTH LOUISIANA

Jackson Parish: Texas Co.'s Tremont Lbr. Co. 1, c ne ne sw 6-16n-1e, bldg dk.

Richland Parish: Roeser-Pendleton's Tensas Delta Land Co. 1, c sw sw 1-14n-5e, lcn.

SOUTH LOUISIANA

Jeff Davis Parish: Union Sulphur Co.'s B. T. Wait 1, 660 fr nl 400 fr el se¼ 18-9s-6w, Iowa se flank, bldg foundation.

MICHIGAN

Isabella County: Collins and Mark's Fedewa 1, sw nw sw 3-14n-5w, dr.

Mecosta County: Chapman Oil Co.'s Stephens 1, s½ nw nw 35-13n-8w, dr.

Montmorency County: E. R. Morris' Rayburn 1, ne ne ne 21-30n-3e, lcn.

Muskegon County: Muskegon Dev. Co.'s Johnson 1, sw sw sw 3-12n-15w, rig.

MISSISSIPPI

Lawrence County: Humble's S. M. Nelson 1, 330 fr sl 1480 fr wl 8-6n-20w, dk.

Pearl River County: Hassie Hunt, Tr.'s R. Batson 1, c ne sw 10-1s-14w, lcn 11,000-ft test.

Yazoo County: Southern Nat. Gas Co.'s Gammil Inv. Co. 1, 600 fr sl 500 fr el nw¼ 5-9n-4w, prep to spud.

NEW MEXICO

Golfax County: Cates & Sidwell's Sauble 1-A, sw se sw 35-27n-24e, lcn.

Lea County: Rowan Drilling Co.'s Simmons 1, c se se 18-10s-38e, lcn 5500-ft San Andres test.

OKLAHOMA

Beckham County: Skelly et al's Baldwin 1, se ne ne 10-9n-25w, mit.

Blaine County: Superior's Norris 1, ne ne ne 17-19n-10w, dr 1955 ft.

Bryan County: Amerada's Williams 1, ne ne sw 27-6s-7e, bldg dk.

Cleveland County: Magnolia's Anneler 1, sw ne 26-6n-1w, mit.

Amerada's Carpenter 1, sw ne nw 17-6n-1e, bldg rig.

Hughes County: Vulcan O&G's Harrell 1, sw sw nw 34-6n-10e, lcn.

Schermerhorn Oil's Harris 1, ne ne ne 5-7n-9e, rur.

Kay County: Pure's Buesing 1, ne se se 32-27n-1e, c&p.

Lincoln County: Wafford-Nicholson-Rose's State 1, ne ne 16-15n-6e, lcn.

McIntosh County: W. B. Pine's Loar 1, ne se sw 12-10n-13e, dr 97 ft.

Noble County: Mid-Continent et al's Robertson 1, nw se ne 30-24n-1w, rur.

Stephens County: Texas Co.'s Helm 1, sw se nw 21-2n-8w, lcn.

WEST TEXAS

Andrews County: Frontier Fuel Oil Corp.-Riddell Pet. Co.'s University 1-A, c nw nw sec 35, blk 13, 2⅞ mi se Devonian prod, lcn Clear Fork test.

Coke County: Harley Sadler et al's J. R. Mims 1-A, 1485 ft nsl 1484 ft ewl T&P Ry. sec 39, blk W, elev 2328 ft, lcn 1750-ft cable test.

Crockett County: Garrett M. Smith et al's V. B. Cox 1, se se se sec 39, blk 8T, 1100-ft cable test, elev 2210 ft, dr 100 ft.

T. P. Coal & Oil Co.'s M. L. Harris 1-F, 330 ft out swc I&GN Ry. 88, blk 1, 1 mi n by w of 1-well outpost sector of Torborg field, lcn.

Gaines County: Amerada's E. H. Jones 1-A, c nw ne PSL 3, blk A-6, lcn 8000-ft Clear Fork test.

Hockley County: Eugene Constantin et al's Vince Drikatnek 1, 440 ft out nec labor 17, Lge 698, State Capitol Lands, 6½ mi nw Yellowhouse pool, lcn 6500-ft Clear Fork test.

Gulf's Mallet 23, 685 ft ewl 4027 ft snl PSL 2, blk X, lcn San Andres test.

Lamb County: Hunt Oil Co.'s E. J. Foust 1, 682 ft nsl 660 ft wel ne¼ sec 43, blk 1, R. M. Thomson sur, lcn Clear Fork test.

Pecos County: Atlantic's Iowa Realty Trust Co. 1, c w¼ of w¼ H&GN Ry. 27, blk 10, 1⅞ mi w Bennett shallow, lcn 6000-ft Ellenburger test.

Ward County: T. F. Slack and Al Parker's Geo. B. McCamey 1, c w¼ of s¼ H&TC Ry. 149, blk 34, 1⅞ mi sw of Delaware wc gasser, lcn Delaware test.

WEST CENTRAL TEXAS

Callahan County: Trumter Pet. Corp.'s Mrs. D. F. Harp 1, 2050 ft nsl 1725 ft ewl sec 66, Bayland Orphan Asylum Lands, lcn 1000-ft cable test.

Comanche County: Kerlyn Oil Co.'s Manes 1, 647 ft nsl 469 ft ewl of I. Truett sur No. 102, A-932, lcn 3300-ft cable test.

Mills County: Dr. Emil Ott et al's Lula Gatlin 1, 3467 ft nsl 1323 ft ewl sec 112, Caldwell CSL sur, lcn 2000-ft cable test.

Shackelford County: Eltex, Ltd.'s G. R. Davis 1, nw nw nw T&P Ry. 57, blk 13, lcn Ellenburger test.

SOUTH CENTRAL TEXAS

Bastrop County: Marts & Beaven's A. P. Erhard 1, 330 fr wl 330 fr nel 329-ac lse, J. M. Bangs sur, lcn 3600-ft test.

Kerr County: Ohio Oil Co.'s C. O. Robinson 1, 660 fr sl 660 fr el ne¼ sect 47 on Dan Auld's 13,000-ac blk, T&NG sur A-454, cable tool Ordovician test.

Kimble County: E. M. Wahlemier's Dan Morales 1, 660 fr sl 660 fr wl Z. H. Short Heirs sur 97, lcn Ordovician test.

SOUTHWEST TEXAS

Duval County: J. W. Gorman-Parker and McCune's Juan Carrillo 1, 330 fr sl 3557 fr wl 296-ac lse, lcn 5500-ft test.

Jim Hogg County: Delk Investment Co.'s E. L. Armstrong 1, 2310 fr el sur 107 330 n of sl 80-ac lse and sur 107, lcn 3800-ft test.

Sun's A. C. Jones 7, 11,000 fr wl 44,323-ac lse, Agua Nueva de Abajo Gr, 3500 n nw of interior cor, lcn 3000-ft test.

Starr County: George Irving's M. M. Garcia 1, 1650 fr sl 330 fr el tr 215, porc 90, 140-ac lse, elev 336.5 ft, lcn 3500-ft test.

Sun's Christiana M. Perez 1, 1333 fr el 1450 fr sl tr 6 porc 95 457-ac lse, elev 335 ft, lcn 6000-ft test.

LOWER TEXAS COAST

Bee County: W. Earl Rowe et al's Walters 1, 1230 fr nl 1200 fr swl F. O. Skidmore sur, 1099-ac lse, lcn.

Dewitt County: Sohio's E. G. Schiwetz 1, 1980 fr nel 660 fr nwl 215-ac lse, Agapo Mancho sur A-703, 2 mi sw Yorktown, lcn 8500-ft test.

Golind County: Lewis Lawlor's J. G. Swickheimer 1, 467 fr s&wl nw¼ 40-ac lse blk 23, Cuadrilla Irrig. Co. sur, lcn 4850-ft test.

Jackson County: Humble's Four Way Rch. C-1, 660 fr n&el blk 20 Young Coleman sur A-13 on 1001.6-ac lse in 2nd subdvn of Laward Farms, 1 mi s Maurbro fld, 3 mi ne Laward, spud.

Jim Wells County: Butcher-Arthur Co.-H. R. Smith's W. W. West 1, 467 fr swl 3573 fr sel 1000-ac lse, Casa Blanca Gr, 2 mi se Sandia, lcn 6000-ft test.

Nueces County: Southern Minerals Corp.'s T. G. Winston 1, 467 fr sl 467 fr wl 220-ac lse Roberts & White subdvn of Petronolia Rch, lcn 7500-ft test.

TEXAS GULF COAST

Colorado County: Stanolind's E. A. Weise 1, 1320 fr nel 1320 fr sel 480-ac lse, GH&H sur, Chesterville area, ¾ mi s se Magnolia's disc Anderson 1, lcn 9750-ft test.

Harris County: Magnolia's Warren Rch. 2, 3055 fr nl 1086 fr wl Joshua Hudson sur, 7300-ac lse, 1000 swly fr Warren 1 dr 7744 ft in salt, lcn 10,000-ft test.

Glenn McCarthy's E. F. Lemm 1, 330 fr nw&swl Wm. Lemm sur A-519, on 54-ac lse, 1.7 mi s of Spring, lcn 7500-ft test.

Wharton County: Texas Co.'s H. R. Matzke 1, start intersection T&NO RR with wl sect 26 I&GN sur A-244, go 3150 ne alg s row RR th 330 sely to lcn 1814 fr sl n½ sect 26, lcn 6500-ft test.

EAST TEXAS BORDER COUNTIES

Shelby County: Roger Lacy's Hayden 1, 1350 fr sl 640 fr el 152-ac Hayden tr, D.T.F. Yorkdt sur, ru.

EAST TEXAS

Leon County: Al G. Hill et al's Fee (J. M. Kiser) 1, 1000 ft n of m/s/sl 467 ft e of m/s/wl of 258-ac tr and I&GN Ry. sur A-987, mim for 6200-ft Woodbine test.

Smith County: Sinclair Prairie's D. D. Shofner 1, Chapel Hill Smackover new pay test, 2350 ft snl 660 ft ewl of Wm. Dickerson sur A-301, lcn 13,000-ft test.

Upshur County: Hunt Oil Co.'s D. T. Bullard 1, 725 ft wel 785 ft s of m/s/n of 40-ac, or 1850 ft n 450 ft w of swc of J. Henson sur, but in Lemuel B. Brown sur, lcn 8500-ft Travis Peak test.

NORTH TEXAS

Archer County: Bridwell Oil Co.'s V. F. Veitenheimer 1, 450 ft wel 1050 ft nsl sec 66, blk 4, Clark-Plumb sur, lcn 1100-ft rotary test.

W. C. Young et al's C. King 1, 1310 ft ewl 1050 ft nsl TE&L Co. sec 2422, lcn 1500-ft rotary test.

Wilbarger County: Pennowa O&G Co.'s M. J. Moore 1, 330 ft out nwc blk 61, Waggoner Colony Lands, lcn 2000-ft cable test.

WYOMING

Natrona County: General Petroleum's Gov't. 78, ne se ne 8-35n-77w, n exten Cole Creek fld, lcn.

WESTERN CANADA

Alberta Foothills—Priddis-Black Diamond: Calling Valley Oils' No. 1 c lsd 6 24-21-3w5th, elev 3850 ft, ru.

Southern Alberta Plains—Crow Indian Lake: California-Standard's Crow-Indian Lake-Province 2, se lsd 1 20-4-14w4th, elev 3073.1 ft, ru.

Legend: California-Standard's Legend-Province 3, nw lsd 13 23-7-13w4th, mir.

Squeaks from the Bull Wheel

When You're Drunk

He is not drunk who, from the floor,
Can rise again and drink some more;
But he is drunk, who prostrate lies,
And cannot drink and cannot rise.

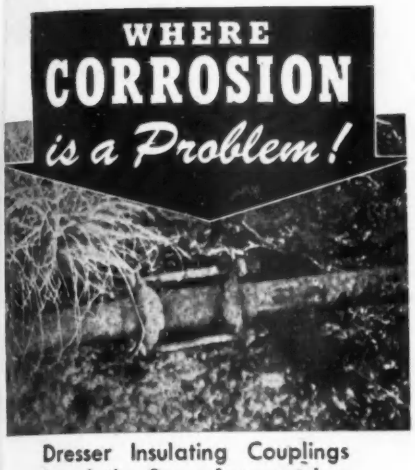
Faithful Lady

Rastus' eye roved over the cuddlesome contours of the dusky belle and he immediately began a flanking attack.

"Whoa," said she. "Is you a member of the 33rd Infantry, the 47th Coast Artillery, the 22nd Cavalry or the 143rd Marines?"

"No, honey."

"Then go 'way. I'se private stock."



Dresser Insulating Couplings break the flow of current between pipe lengths, prevent hot spots and electrolytic corrosion on the gathering line shown in the above photo.

•

Complete stock of "Dressers" ready at Dresser Houston Warehouse. Contact your distributor

PHONE: CHARTER 4-4723; L.D. 2107

DRESSER
HOUSTON WAREHOUSE
1121 Rothwell St. Sec. 16, Houston, Texas

BE SURE TO CHECK . . . .

Trading Post Section

ON PAGE 83 OF THIS ISSUE

Because of the scarcity of certain types of new equipment and the fact that some operators may have a surplus of some items and a serious shortage of others, this **Used Equipment Forum** is performing a valuable service to operators in locating needed used materials or disposing of surpluses that may be needed by others.

Loving Wife

"Mother, may I go in to swim?"
"No. It's too deep."
"But daddy is swimming."
"Yes, but he's insured."

How to Get Bacon

Now doth the festive hunter
Go forth with gun and dog
To shoot at leaping rabbits
And kill some farmer's hog!

Missing Friend

"Lady, that blanket on the top shelf is the only one in the store I haven't shown you."

"Never mind. I was just looking for a friend, anyway."

"Well, if you think she's in that remaining blanket, I'll gladly get it down for you."

Need Some Soap?

Use Chummo soap. Doesn't lather, won't float. Just company in the bathtub.

No Sale

Insurance agent: "Do you want a straight life?"

Puzzled prospect: "Well, I like to step out every now and then."

Potent Potion

"That wolf I was with last night gave me a miniature cocktail."

"Well?"

"One drink and in a miniature out."

Hard on the Road

"Why is your tongue black?"

"I dropped a bottle of whiskey where they were tarring the road."

Had to Happen

"I regret to inform you that your wife's mind is completely gone."

"Well, I'm not surprised, Doc. She's been giving me a piece of it every day for 20 years."

False Armistice

Seeing his captain take a swift kick at the major, a private let out a whoop of joy and aimed his toe at the hindside of the top sergeant.

At the court-marshal, the shamefaced captain explained that he was tormented with corns and when one of his feet was stepped on, he instinctively lashed out with the other.

The court accepted the explanation and turned its stern attention to the perspiring private.

"Gosh, sir," he gulped. "When I saw the captain boot the major, I figured the war was over!"

A Smarter Gabriel

A certain level-headed Vermont citizen was troubled with a wife who was a Millerite. One bitter winter night she announced that the end of the world was at hand, and remained awake to witness its coming. Jacob, the husband, needed rest, and having no confidence in his wife's prediction, went to sleep.

About two o'clock in the morning his wife shook him violently and cried out, "Wake, Jacob, wake! Gabriel is coming. I can hear his chariot wheels!"

"Go to sleep, you fool. Do you s'pose he'd come on wheels on a fine sleighin' night like this?"

LET JOHN FIELD-MAN HELP YOU SOLVE YOUR NEXT WATER CONDITIONING PROBLEM!

Call
JOHN FIELD-MAN
ON YOUR NEXT WATER CONDITIONING JOB

LELAND HAMNER CO.

LELAND HAMNER CO.
P. O. Box 1065 · Capitol 9758 · Long Distance LD 2175
2211 PRESTON AVE. HOUSTON, TEXAS

UNIBOLT
THE ONE BOLT COUPLING

UNIBOLT XMAS TREE FITTINGS

(Compared with flanged fittings)

Weigh a great deal less . . . have a substantially higher safety factor . . . and are easier on your pocketbook.

THORNHILL-CRAVER COMPANY
HOUSTON

William M. Barret, Inc.
Consulting Geophysicists

Specializing In Magnetic Surveys

Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique

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HOUSTON LABORATORIES
Analytical and Consulting Chemist
Podbielniak Gas Analysis
Oil Field Brines, Waters and Cores
Complete Evaluation of Crude Oils
Long Distance 267, Box 132, Houston, Tex.

THE FORT WORTH LABORATORIES
Analysis of oil field brines, cores, gas, oil and minerals. Field gas testing. R. H. Fash, Vice President; Long Distance 138
823½ Monroe Street, Fort Worth, Texas

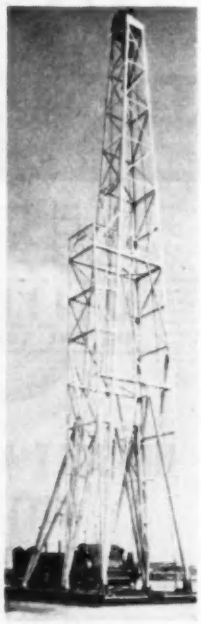
Notes for the Equipment Buyer and User

Portable Mast for Drilling

EMSCO DERRICK & EQUIPMENT COMPANY

Emsco Derrick & Equipment Company, Los Angeles, announces the Emsco 12-P Portable Mast, designed to meet several long-felt needs in drilling pratcice.

The mast is fabricated in seven welded sections for convenient transportation. The sections are quickly assembled on the ground or on cribbing. The crown and traveling blocks are strung for drilling and, with the aid of an auxiliary line, the mast is raised by the drawworks. The skid base breaks down to road widths for hauling and is furnished in lengths to suit the rig. Any standard unitized drawworks and any rotary table may be used.



Emsco Mast

Perfect visibility is secured in the mast by patented bulge construction for inside racking by the line arrangement used in raising and lowering the mast by symmetrical spacing of legs with respect to the center of the well, and by a high V window which affords the advantages of an open face without any disadvantages.

Maximum safety is assured by a positive strain on the line during the raising or lowering operation by means of a pivot point change. The center of rotation is shifted by an arrangement of the base connections, making it unnecessary to pull the mast off center when lowering it or to use a snub line when raising it. The center of gravity of the mast never passes over the pivot point, thus making it impossible for a slack line to develop, or for the mast to drop. These features are claimed to give perfect visibility between the driller and the working platform, and clear unobstructed working space inside the mast.

Lacing of all four faces results in maximum stiffness in the mast. The crown block is concentrically mounted, resulting in an equal loading of the legs, which means excellent distribution of the load on the foundation.

Standard equipment includes a catline sheave, built-in deadline anchor and ladders on both ginpole and mast. Optional equipment includes sandline sheave and crown safety platform.

Win Army-Navy Award

The Moorlane Company, Tulsa, subcontractors for portable pipe lines widely used by the Army, were presented the Army-Navy "E" pennant.

Honored by E Award

Union Chain and Manufacturing Company, Sandusky, Ohio, was awarded the Army and Navy E, October 21, for excellence in production of war equipment.

Le Roi Company Appoints Export Representative

Le Roi Company, Milwaukee, Wisconsin, has appointed Russell D. Heath, New York City, as export petroleum industry representative.

Russell D. Heath

Heath was formerly connected with the Westinghouse Electric International Company for more than 20 years, in charge of export petroleum and mining industry sales. He is familiar with petroleum operations throughout the world and has for many years been in contact with the major oil companies' export offices in New York, analyzing their requirements and preparing technical data applying to oil field operations. He has traveled extensively in South and Central America.

Dresser Industries Central Offices Moved to Cleveland

Dresser Industries will move headquarters from Bradford, Pennsylvania, to Cleveland, with executive offices in the Terminal Tower.

Cleveland already is the home of a Dresser Industries' member company, The Bryant Heater Company, and of an affiliate, Van der Horst Corporation of America. Dresser Industries, Incorporated, is the parent corporation of a group now comprising 10 companies, all in related lines of manufacture.

The factory of the Dresser Manufacturing Division at Bradford, up to now the parent corporation of the Dresser group, will remain in Bradford and operate as Dresser Manufacturing Division of Dresser Industries, Incorporated. Formerly it was Dresser Manufacturing Company. The change in name will not affect personnel, products or development program, it was announced.

National Tube Firm Names Indiana Man Vice President

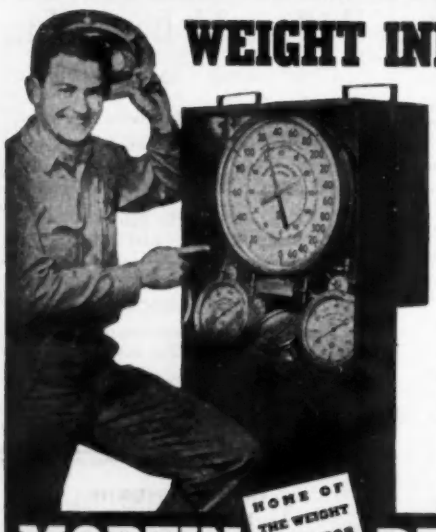
National Tube Company, subsidiary of United States Steel Corporation, Dallas, announced that Leo J. Mason, Gary, Indiana, has been named vice president.

He has been associated with the firm since 1918.

Oilwell Chemical Company Organized in Fort Worth

Oilwell Chemical Service Company has been organized in Fort Worth, by Fred R. Holland and S. J. Iverson to engage in plastic plugging of wells. Operations are being carried on at Odessa, Longview, and Wichita Falls, Texas.

The company is a patent licensee of



WEIGHT INDICATOR POINTS

FOR QUICK JOBS . . . MAXIMUM PORTABILITY—IT'S THE "CLIPPER"

—For shallow drilling, running tubing, setting packers and liners, fishing—wherever minimum rig-up time and maximum portability are essential, the Martin-Decker "CLIPPER" Tool Pusher Type Weight Indicator is the instrument for the job. It combines in one compact, streamlined unit complete accuracy, portability and adaptability for all drilling and production operations not requiring a chart record. Off and on the dead line in an instant, the Clipper is easily transported from rig to rig and can be used in any spot at any time . . . eliminating haphazard guess work or estimations.

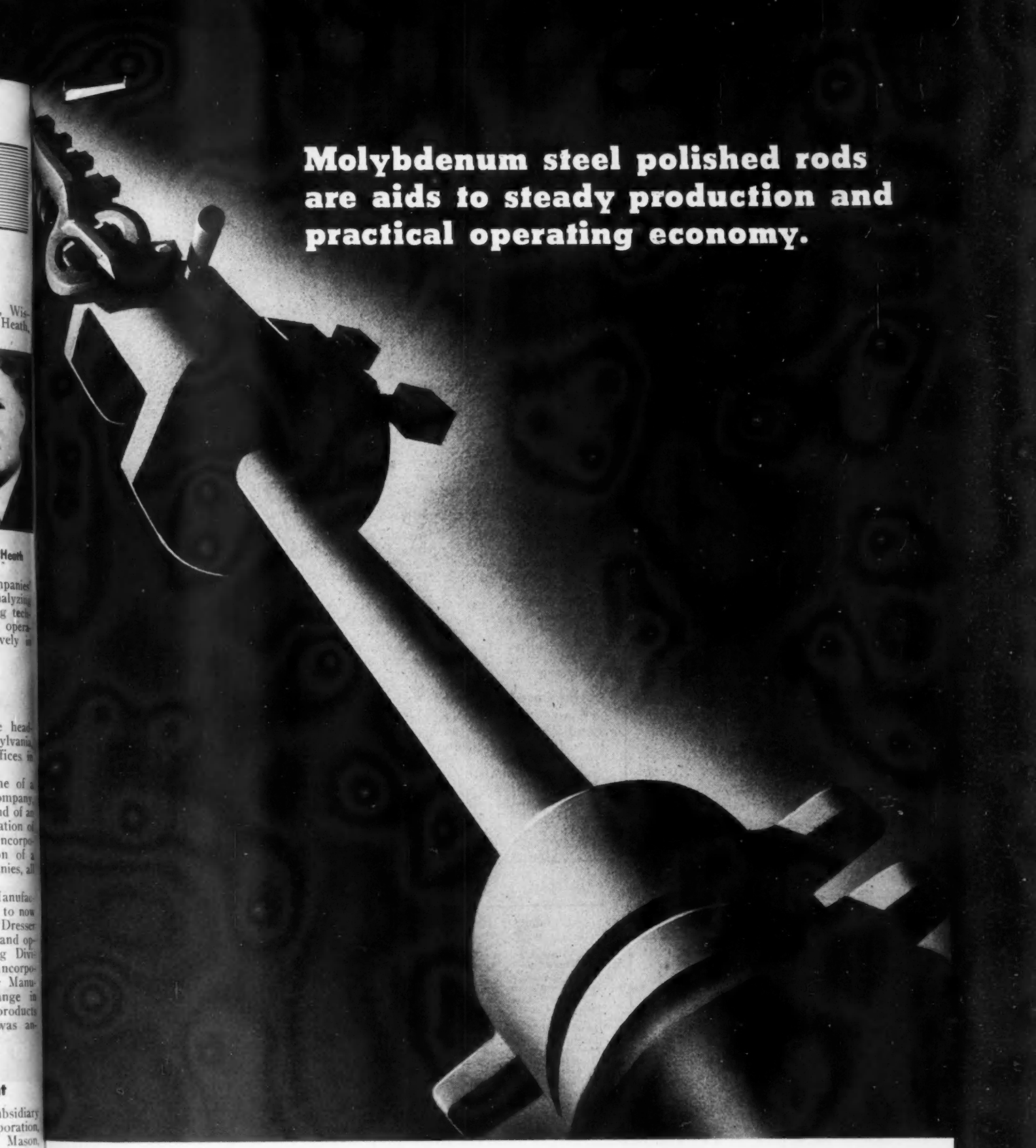
Easy to Read Extremely Accurate
Completely Self-Contained

HOME OF THE WEIGHT INDICATOR

MARTIN DECKER CORP.

LONG BEACH, CALIFORNIA

SAN JOAQUIN VALLEY: A. F. McQUISTON, BAKERSFIELD, CALIFORNIA
MID-CONTINENT DISTRIBUTOR: REED ROLLER BIT COMPANY, HOUSTON, TEXAS



CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

ARMY E NAVY

MOLYBDIC OXIDE, BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company

MOLY

500 Fifth Avenue · New York City

ORBIT

MASTER VALVES

with

UNEQUAL FLANGES

The **ORBIT GEAR OPERATED MASTER VALVE** makes your Christmas Tree more compact by eliminating the use of an adapter flange — also eliminating chances for additional gasket leaks. The Unequal Flanges are cast integral with the body of the Valve.

Orbit Gear Operated Master Valve

This valve can be furnished thru all fabricators of Xmas Trees or thru any of your local supply stores at a price comparable to that of leading plug valves, **YET,** this valve requires no lubrication to effect a seal.

See 1944 Composite Catalog

ORBIT VALVES

OIL WELL IMPROVEMENTS COMPANY

TULSA, OKLAHOMA

SERVICE REPRESENTATIVES

R. G. "Bob" Cole, Houston, Texas
Phone Fairfax 0057
Warehouse 1121 Rothwell, Sect. 15, Houston

Earl F. Warren, Phone 919-W, Alice, Texas

Rex E. Galloup, Phone 6436, Lubbock, Texas

Dow Chemical Company and is using plastics as an adhesive in place of cement for shutting off bottom hole water, lowering gas-oil ratios, repairing leaky casing seats and other tasks.

Interest in Firm Sold

D. F. Payte of the Empire Oil Field Machinery Company, has purchased B. R. Schabarum's interest in the concern, which operates a specialized machine shop and store at Odessa, Texas. The company will continue to operate under the same name, with Payte as manager, and A. C. Evans in charge of sales offices in the McBirney Building, Tulsa.

Wins Production Award

Houston Oil Field Material Company, Houston, has been awarded its first star to be added to the Army-Navy E flag which the company received six months ago. The star is for continued excellence in production of landing gear struts for skytrains.

Plastic Coatings Catalog

Amercoat Division, American Pipe and Construction Company, P.O. Box 3428 Terminal Annex, Los Angeles 54, has released a catalog on plastic coatings.

The booklet illustrates and describes the many proven uses of plastic coatings in a wide range of industries, including a list of organic and inorganic materials now being protected against corrosion or contamination.

Lathe Catalog Issued

South Bend Lathe Works, South Bend 22, Indiana, has released a catalog, 100-D, describing engine, toolroom, and precision turret lathes. Engine lathes and tool-room lathes are shown in five sizes, ranging from 9 to 16 inches swing. Precision turret lathes are one-half and one-inch capacity respectively. Complete specifications are listed opposite each lathe illustration.

Allis-Chalmers Appoints Norwood, Ohio, Manager

Allis-Chalmers, Milwaukee, Wisconsin, has appointed R. W. Davis general manager of the Norwood, Ohio, works. Davis formerly was assistant manager of the electrical department at Milwaukee, but for nearly two years had been on leave as director of the electrical equipment branch in the War Production Board.

Opens Houston Office

R. E. Dansby announces that Dansby Mud Engineering Service has established offices at 514 Sterling Building, Houston. The organization will offer a mud and laboratory testing service for drilling operators and manufacturers of mud products for use in oil field drilling.

Gear Book Published

Link-Belt Company 307 N. Michigan Avenue, Chicago, Illinois, has published a complete data book on worm gear speed reducers for industrial applications. The publication is No. 1824 and contains photographs, dimensioned line drawings, engineering data, horse power ratings, and tables of weights and dimensions, all designed to aid in selection of the type and size of reducer required for a specific service.

Periodical Is Winner

For outstanding excellence and value to the war effort, the house organ of Lane-Wells Company, *Tomorrow's Tools —Today*, was selected a winner in the "Leaders of 1944" contest at the convention of the Direct Mail Advertising Association in New York City.

☆

JAMES D. HANCOCK, Dallas producer, and C. N. Anderson, McCamey, Texas, contractor, have formed the Hanco Well Servicing Company with capital stock of $25,000 and headquarters in the Republic National Bank Building, Dallas.

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